Exhibit 8

Western Digital Accused Products

The following list of Accused Products is exemplary, non-exhaustive, and non-limiting. Greenthread asserts claims against all product variations and part numbers of the Accused Products.

	Solid State Drives (SSDs)
1.	WD_BLACK SN850X NVMe™ SSD
2.	SanDisk Extreme PRO Portable SSD V2
3.	My Passport™ SSD
4.	PRO-BLADE TRANSPORT
5.	WD_BLACK SN850 NVMe™ SSD for PS5™ Consoles
6.	SanDisk Ultra 3D SSD
7.	SanDisk Extreme Portable SSD V2
8.	WD Blue SA510 SATA SSD 2.5”/7mm Cased
9.	PRO-BLADE SSD Mag
10.	WD_BLACK P40 Game Drive SSD
11.	WD Green SN350 NVMe™ SSD
12.	G-DRIVE SSD
13.	WD_BLACK SN770 NVMe™ SSD
14.	SanDisk® Portable SSD
15.	WD Red SN700 NVMe SSD
16.	WD Blue SA510 SATA SSD M.2 2280
17.	WD_BLACK™ D30 Game Drive SSD for Xbox™
18.	SanDisk SSD Plus
19.	WD_BLACK SN750 NVMe™ SSD
20.	WD Green™ SATA SSD 2.5”/7mm Cased
21.	WD Red™ SA500 NAS SATA SSD M.2 2280
22.	WD Elements™ SE SSD
23.	WD Blue™ SATA SSD 2.5”/7mm cased
24.	WD_BLACK P50 Game Drive SSD
25.	WD Red™ SA500 NAS SATA SSD 2.5”/7mm Cased
26.	WD_BLACK D50 Game Dock NVMe™ SSD

27.	WD Blue™ SATA SSD M.2 2280
28.	WD_BLACK D30 Game Drive SSD
29.	WD Green™ SATA SSD M.2 2280
30.	OpenFlex Data24 NVMe-oF Storage Platform
31.	Ultrastar Edge Transportable Edge Server
32.	Ultrastar Edge-MR Ruggedized Edge Server
33.	WD Gold™ Enterprise Class NVMe™ SSD
34.	Ultrastar DC SN640
35.	Ultrastar DC SA210
36.	Ultrastar DC SN840
37.	Ultrastar DC ZN540
38.	Western Digital PC SN810 NVMe SSD
39.	Western Digital CL SN520 NVMe SSD
40.	WD Blue SN570 NVMe™ SSD
41.	G-DRIVE™ PRO STUDIO SSD
42.	PC SN540 NVMe SSD
43.	PRO-G40 SSD
44.	RapidFlex NVMe™-oF Controllers - A2000
45.	RapidFlex NVMe™-oF Controllers - C2000
46.	Western Digital PC SN740 NVMe™ SSD
47.	Western Digital PC SA510 SATA SSD
48.	Ultrastar DC SN650
49.	PRO-BLADE STATION
50.	SanDisk Extreme PRO M.2 NVMe 3D SSD
51.	SanDisk Extreme Pro® Portable SSD
52.	WD_BLACK - The Game Awards Limited Edition
53.	WD_BLACK D50 Game Dock
54.	WD_BLACK AN1500 NVMe SSD Add-in-Card
55.	WD_BLACK SN850 NVMe™ SSD
56.	WD® Gaming Drive Accelerated for Xbox One™
57.	WD_BLACK™ Call of Duty®: Black Ops Cold War Special Edition P50 Game Drive NVMe™ SSD

58.	WD_BLACK™ Call of Duty®: Black Ops Cold War Special Edition SN850 NVMe™ SSD
59.	easystore SSD
60.	G-DRIVE ArmorLock SSD
61.	G-DRIVE PRO SSD
62.	G-RAID SHUTTLE SSD
63.	WD_BLACK SN750 SE NVMe™ SSD Battlefield™ 2042 PC Game Code Bundle
64.	RapidFlex NVMe™-oF Controllers - A1000
65.	RapidFlex NVMe™-oF Controllers - C1000
66.	PC SA530 3D NAND SATA SSD
67.	PC SN530 NVMe SSD
68.	PC SN730 NVMe SSD
69.	easystore SSD Portable Storage
70.	Industrial NVMe SSD
	USB Flash Drives
71.	SanDisk Ultra® Dual Drive Luxe USB Type-C™ Flash Drive
72.	SanDisk Ultra Dual Drive Go USB Type-C, Rainbow Pride Limited Edition
73.	SanDisk Ultra Eco™ USB 3.2 Flash Drive
74.	Ultra Dual Drive USB 3.0
75.	Ultra Dual Drive m3.0
76.	SanDisk Ultra Luxe™ USB 3.1 Flash Drive
77.	SanDisk Ultra Flair USB 3.0 Flash Drive
78.	SanDisk Ultra USB 3.0 Flash Drive
79.	Cruzer Glide 3.0 USB Flash Drive
80.	Cruzer Force USB Flash Drive
81.	Cruzer Glide USB Flash Drive
82.	Cruzer Blade USB Flash Drive
83.	Cruzer Fit USB Flash Drive
84.	SanDisk Ultra Fit USB 3.2 Flash Drive
85.	Ultra Dual Drive Go USB Type-C™

86.	SANDISK® CRUZER SPARK™ USB 2.0 Flash Drive
87.	SanDisk Ultra® USB Type-C™ Flash Drive
88.	SanDisk® Ultra Shift™ USB 3.0 Flash Drive
89.	iXpand™ Flash Drive Flip
90.	SanDisk® iXpand® Flash Drive Luxe
91.	SanDisk Extreme PRO® USB 3.2 Solid State Flash Drive
92.	easystore USB
93.	iXpand Flash Drive Go
94.	Ultra Dual Drive USB Type-C
95.	SanDisk Extreme Go USB 3.1 Flash Drive
96.	SanDisk Extreme Go USB Drive
	Memory Cards
97.	SanDisk Extreme® microSDXC™ UHS-I CARD
98.	SanDisk Extreme Pro CFexpress® Card Type B
99.	Nintendo®-Licensed Memory Cards For Nintendo Switch™
100.	SanDisk MAX ENDURANCE microSD™ Card
101.	SanDisk microSDXC™ card for Nintendo Switch™, Fortnite® Edition
102.	SanDisk Extreme SD UHS-I Card
103.	SanDisk Extreme PRO SDXC™ UHS-II Card
104.	SanDisk Professional PRO-READER SD and microSD™
105.	SanDisk Extreme PRO microSDXC™ UHS-I CARD
106.	SanDisk Extreme PRO® SDHC™ and SDXC™ UHS-II cards
107.	PRO-CINEMA CFexpress® VPG400 Type B
108.	SanDisk Extreme SD UHS-I Card (Up to 150 MBPs)
109.	SanDisk Extreme PRO® SDHC™ And SDXC™ UHS-I Card (Up to 170 MBPs)
110.	SanDisk Extreme microSDXC™ UHS-I CARD (Up to 160 MBPs)
111.	SanDisk Extreme PRO microSDXC™ UHS-I CARD (Up to 170 MBPs)
112.	SanDisk Extreme microSD™ Card for Mobile Gaming (Up to 160 MBPs)
113.	SanDisk Ultra® microSD™ Card for Chromebook
114.	SanDisk Ultra microSD with SD Adapter
115.	SanDisk Ultra® SDHC™ UHS-I card and SDXC™ UHS-I card

116.	SDHC/SDXC Memory Card
117.	SanDisk High Endurance microSD™ Card
118.	WD Purple SC QD101 Ultra Endurance microSD Card
119.	SanDisk Extreme microSD™ Card for Mobile Gaming
120.	SanDisk Extreme Pro CFexpress® Card Type B
121.	SanDisk Ultra® SDHC™ UHS-I card and SDXC™ UHS-I card (Up to 120MBPs)
122.	SanDisk Ultra microSD with SD Adapter (Up to 120MBPs)
123.	Extreme CompactFlash Memory Card
124.	Extreme Pro CompactFlash Memory Card
125.	SanDisk Extreme PRO CFast 2.0 Memory Card
126.	SanDisk Extreme PRO SDHC™ And SDXC™ UHS-I Card
127.	SanDisk Ultra® microSD™ Card for Chromebook (Up to 120MBPs)
128.	SanDisk Extreme PRO® SDHC™ And SDXC™ UHS-I Card
129.	SanDisk Ultra microSD UHS-I Card
130.	Ultra SDHC/SDXC Memory Card
131.	SanDisk® microSDXC™ card for Nintendo Switch™, Apex Legends
132.	SanDisk Extreme PRO® UHS-II Card
133.	Commercial Edge SD Card
134.	Commercial Edge microSD Card
135.	Industrial microSD Card
136.	Industrial SD Card
137.	Automotive SD Card
138.	Connected Home Edge+ SD Card
139.	Connected Home Edge+ microSD Card
	Data Center Storage
140.	WD Gold™ Enterprise Class NVMe™ SSD
141.	Embedded Flash
142.	Connected Home e.MMC
143.	Automotive e.MMC
144.	Commercial UFS
145.	Automotive UFS

146.	Commercial e.MMC
147.	Industrial UFS
148.	Industrial e.MMC
	Network Attached Storage
149.	WD Red SN700 NVMe SSD
150.	WD Red™ SA500 NAS SATA SSD 2.5”/7mm Cased

Exhibit A-1 to Greenthread's Complaint

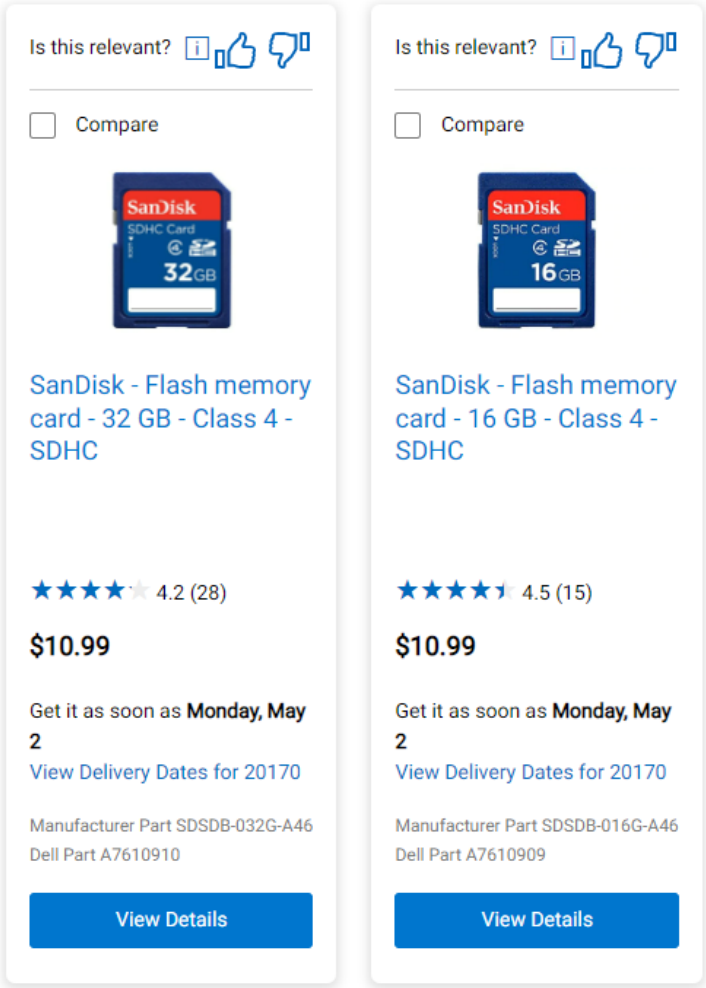
U.S. Patent No. 10,510,842	Accused Products
[Claim 1, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. For example, as shown below, the Defendants sell various examples of flash memory devices (e.g., microSD/SD cards and solid-state drives (SSDs), both of which contain flash memory). Below are examples of SanDisk SDHC (SD High Capacity) flash memory cards:  *See* https://www.dell.com/en-us/search/flash%20memory Below is an example of a SanDisk SSD:

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products

SanDisk Extreme Portable - Solid state drive - 500 GB - external (portable) - USB 3.1 Gen 2

Your life's an adventure. The SanDisk Extreme Portable SSD fits your mobile lifestyle and accelerates every move. Nearly 2x as fast as our previous generation!

Estimated Value ~~$139.99~~

$119.99 You Save $20.00 (14%)

Get it as soon as **Friday, Apr 29**

View Delivery Dates for 95050

Financing As low as $20/mo.^ | Apply for Credit

Up to $3 back in rewards

1 Add to Cart

Manufacturer Part SDSSDE61-500G-G25 | Dell Part AB609642 | Order Code Ab609642 | SanDisk

Compare

Tech Specs

General

Device Type

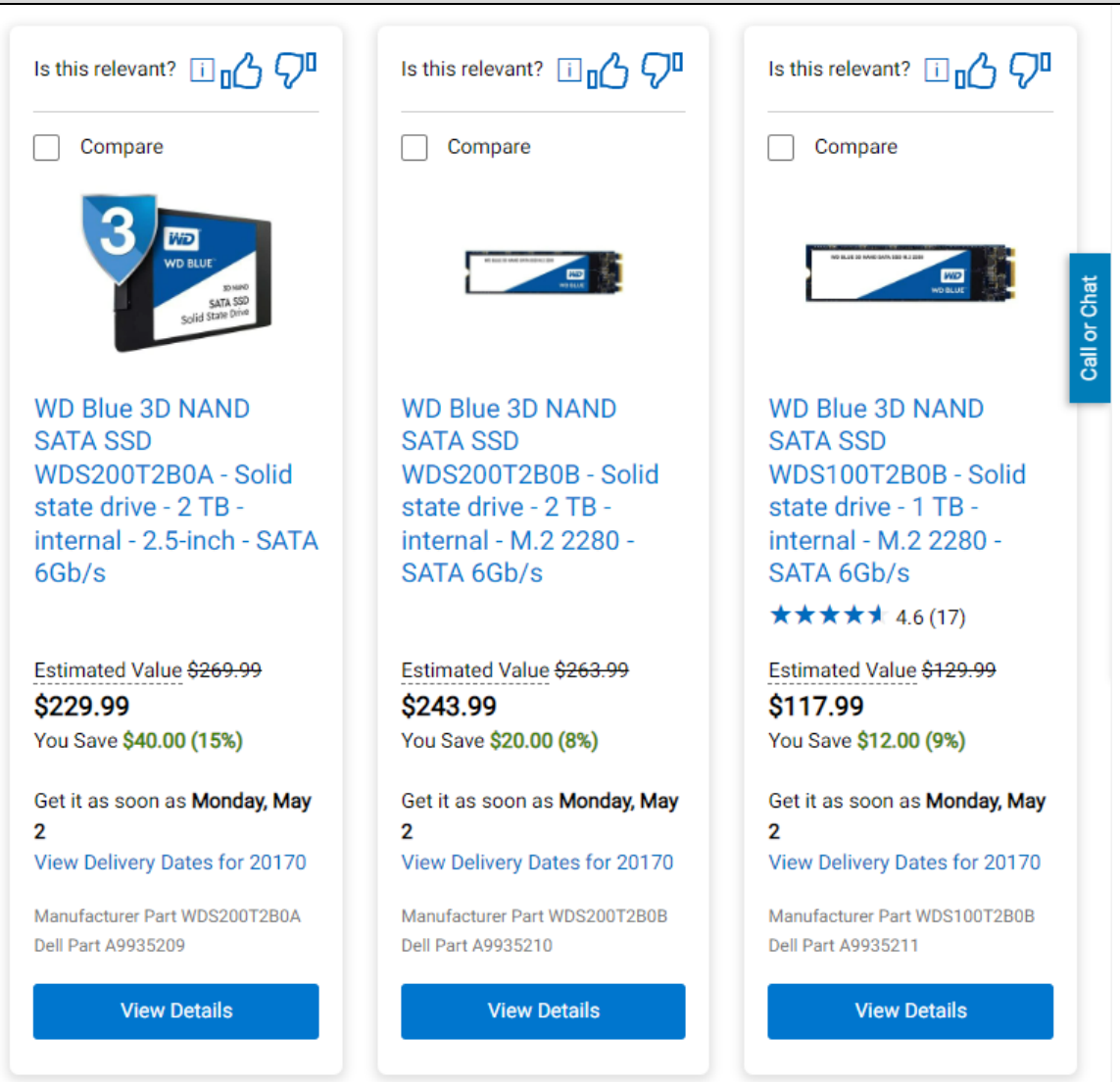
Solid state drive - external (portable)

See https://www.dell.com/en-us/shop/sandisk-extreme-portable-solid-state-drive-500-gb-external-portable-usb-31-gen-2/apd/ab609642/storage-drives-media

Below are examples of Western Digital SSDs:

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products



See https://www.dell.com/en-us/search/wd%20ssd%20blue%203d

Such SSDs, like the other flash memory devices (e.g., SD/microSD cards), are semiconductor devices.

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products
	What is a flash solid-state drive (SSD)? A flash solid-state drive (SSD) is a non-volatile storage device that stores persistent data in flash memory. There are two types of flash memory used in SSDs -- NAND and NOR. *See* https://www.techtarget.com/searchstorage/definition/flash-based-solid-state-drive-SSD Solid state refers to electronic circuitry that is built entirely of semiconductors. The term was originally used to define those electronics, such as a transistor radio that used semiconductors rather than vacuum tubes in its construction. Most electronics today are built around semiconductors and chips. A solid state drive uses, as its primary storage medium, semiconductors rather than the magnetic platters of a conventional hard drive. *See* https://www.lifewire.com/solid-state-drive-833448 The above SanDisk flash memory card and the above SanDisk and Western Digital SSDs are representative examples of the Western Digital Accused Products, e.g., because all of these devices include a flash memory. A SanDisk 15 nm node NAND flash memory has been analyzed via tear-down and is described in this claim chart and other infringement contention claim charts (e.g., Exhibits A-1 through A-6), as explained below, as a representative example of the Western Digital Accused Products. Upon information and belief, other flash memory devices would have similarly been advantageously designed to move carriers (e.g., towards the substrate) and achieve the performance enhancements described and claimed in the '842 patent (and the other asserted patents). For example, other flash memory devices would similarly have been designed with a dopant gradient in order to improve performance characteristics such as on and off switching times and other performance enhancements described in the Abstract of the '842 patent (and the other asserted patents). Therefore, upon information and belief, other Western Digital Accused Products contain similar features as the SanDisk 15 nm node NAND flash memory, and function in a similar way, with respect to the features claimed in the asserted claims. This claim chart is based on publicly available information, and additional information regarding these and other accused products is expected to be obtained through discovery.
[Claim 1, Element 1] a substrate of a first doping type at a first doping level having first and second surfaces;	The Western Digital Accused Products include a semiconductor device comprising a substrate of a first doping type at a first doping level having first and second surfaces. For example, a die of the SanDisk flash memory discussed above for the preamble is shown below:

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products

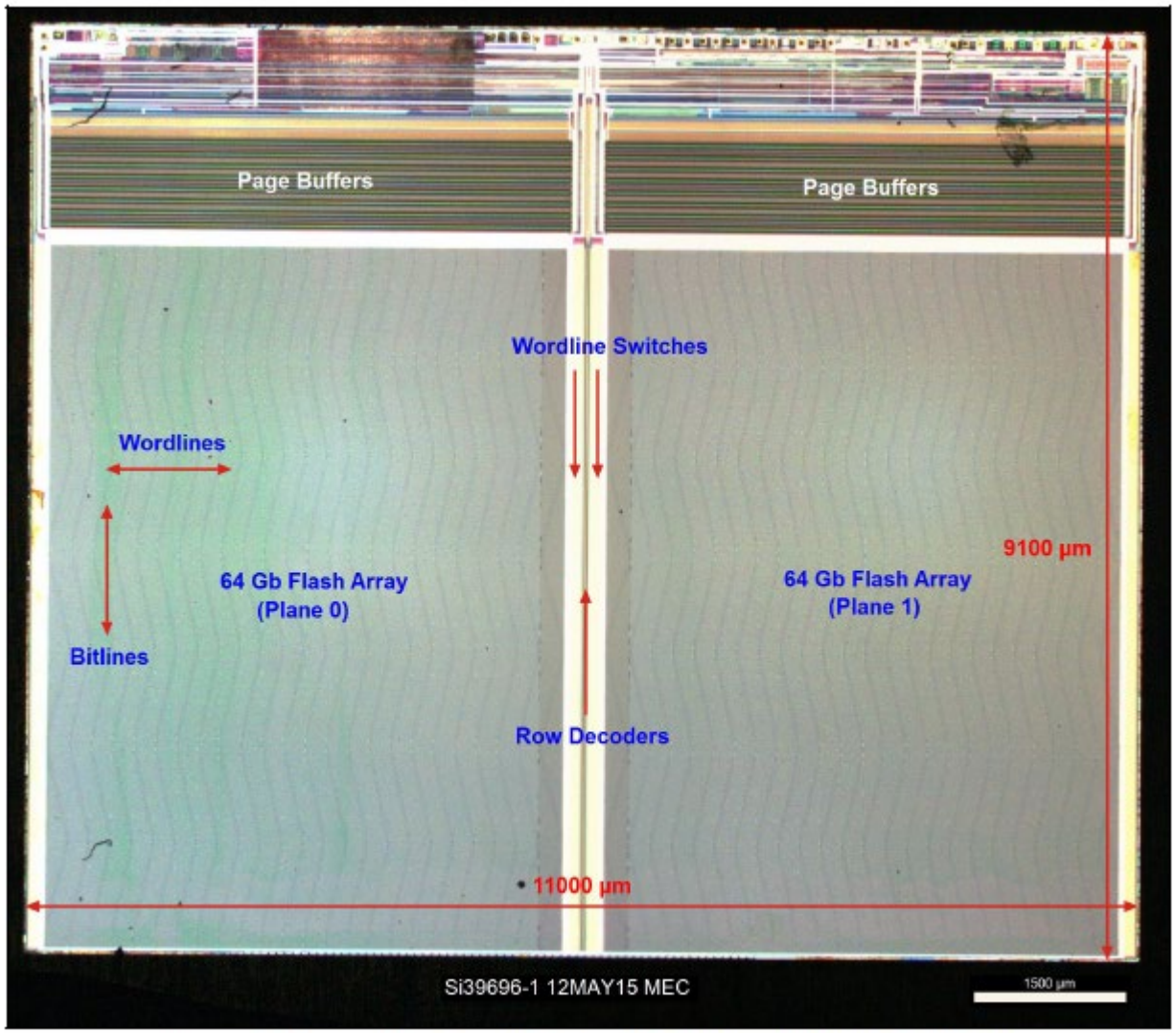


Figure 1.2.1: Die photograph of Toshiba/SanDisk 16 GB NAND die

Exhibit A-1 to Greenthread's Complaint

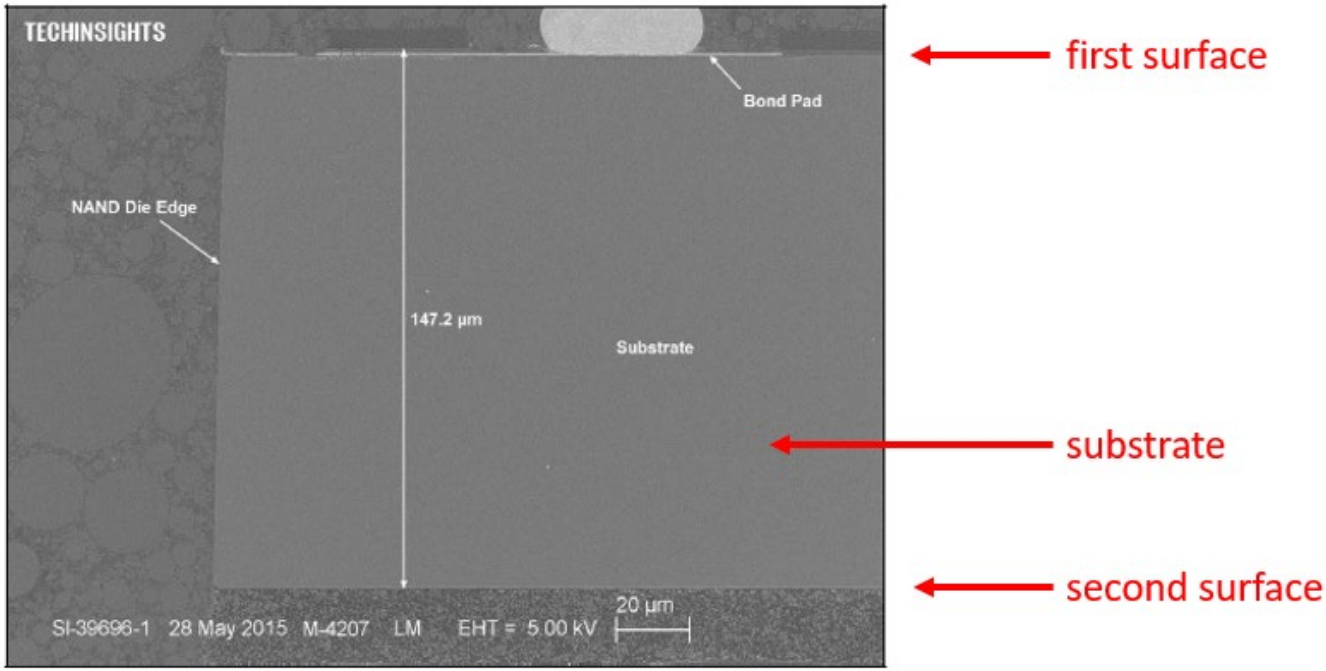
U.S. Patent No. 10,510,842	Accused Products
	The following image of a cross-section of the flash memory die, obtained through scanning electron microscopy (SEM), shows the die having a thickness of 147.2 µm in this example. The flash memory die includes a substrate having first and second surfaces, as shown below:  Figure 1.2.3: Die thickness, SEM cross-sectional image A thickness (depth) of, e.g., 147.2 µm is consistent with the presence of a substrate. Spreading resistance profile (SRP) analysis conducted on the flash memory shows that the substrate is p-type (a first doping type) and has a first doping level (*see* concentration of p-type substrate in below graph).

Exhibit A-1 to Greenthread's Complaint

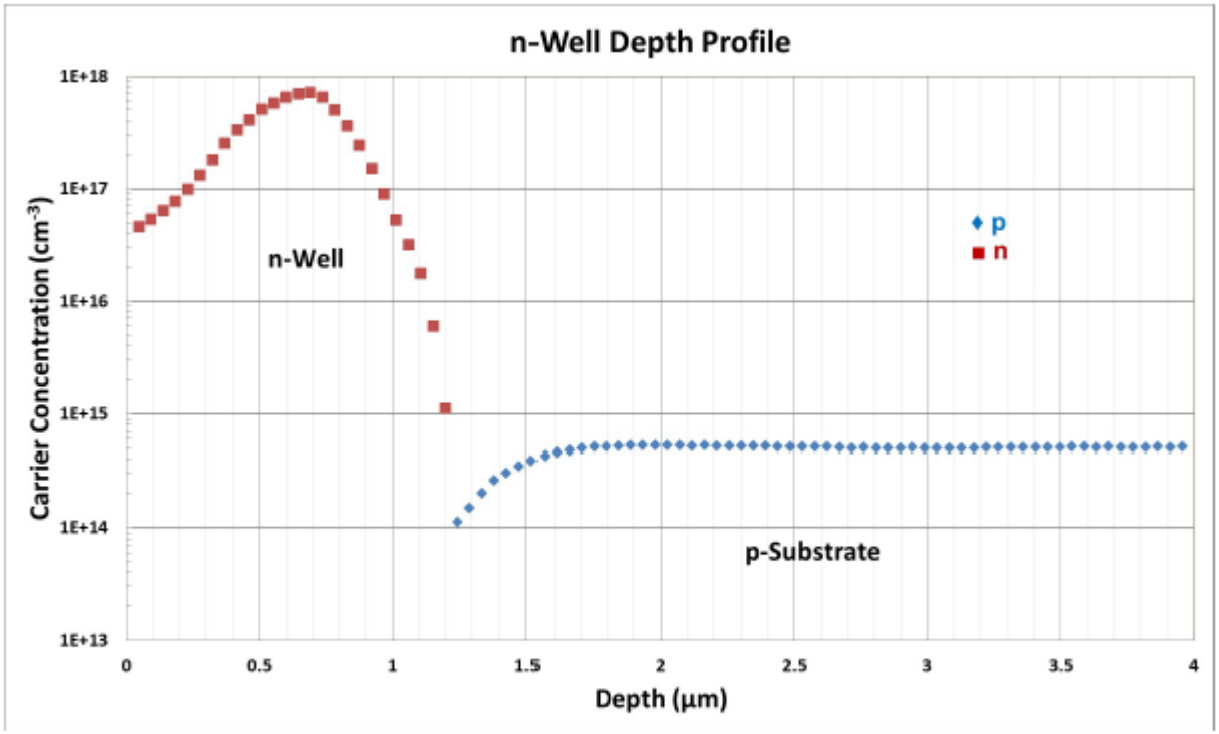
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile
[Claim 1, Element 2] a first active region disposed adjacent the first surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products include a semiconductor device comprising a first active region disposed adjacent the first surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed. For example, the following cross-sectional image (labeled Figure 2.3.5) of the SanDisk flash memory device discussed above, obtained through scanning electron microscopy (SEM), shows a first active region as claimed:

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products

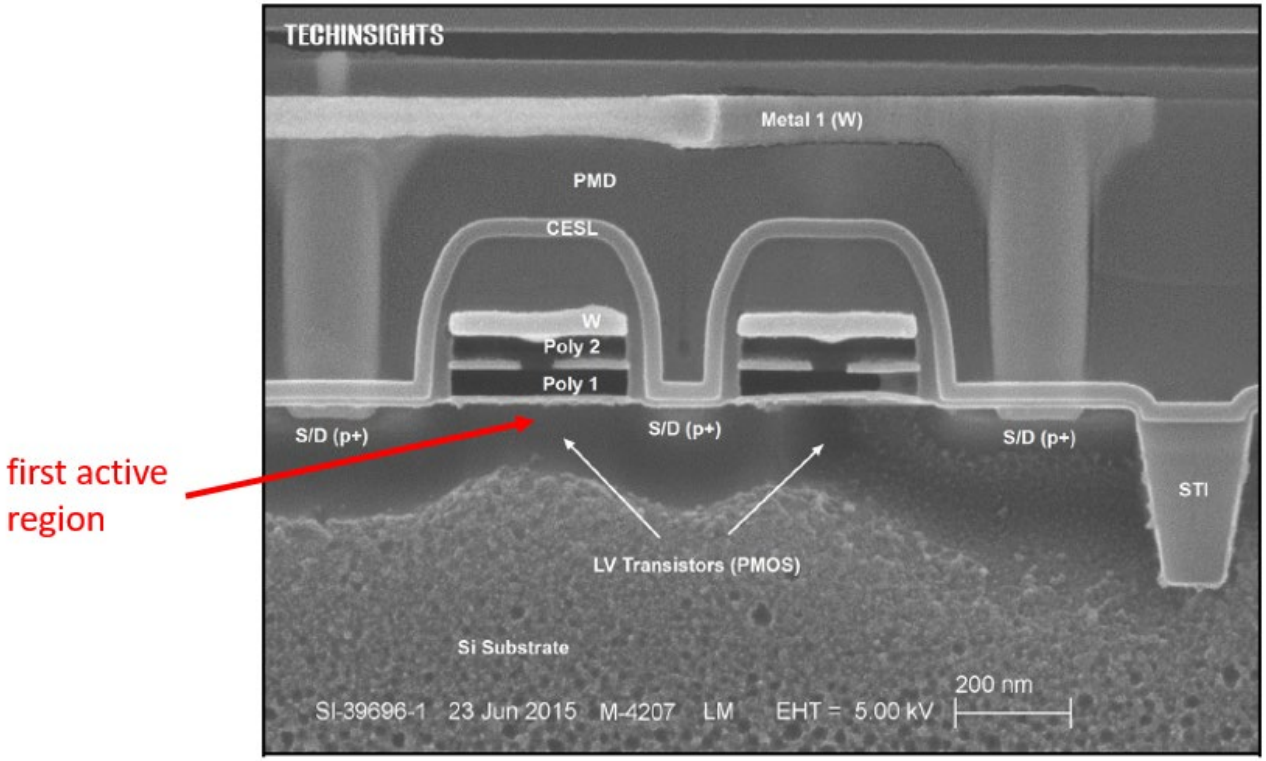


Figure 2.3.5: LV logic PMOS transistors, SEM cross-sectional image with Si etch

A PMOS transistor is shown above the first active region, and thus the first active region is a region within which transistors can be formed. For example, the gate of such a transistor is labeled in the above image. As shown in the above image, the first active region is disposed adjacent the first surface of the substrate.

The first active region has a second doping type (e.g., n-type) opposite in conductivity to the first doping type (p-type), e.g., as PMOS transistors are formed in n-wells. The presence of P^+ diffusion regions to the left and right of the first active region is consistent with the presence of PMOS transistors. The n-type doping of the n-well is also shown in the following SRP graph.

Exhibit A-1 to Greenthread's Complaint

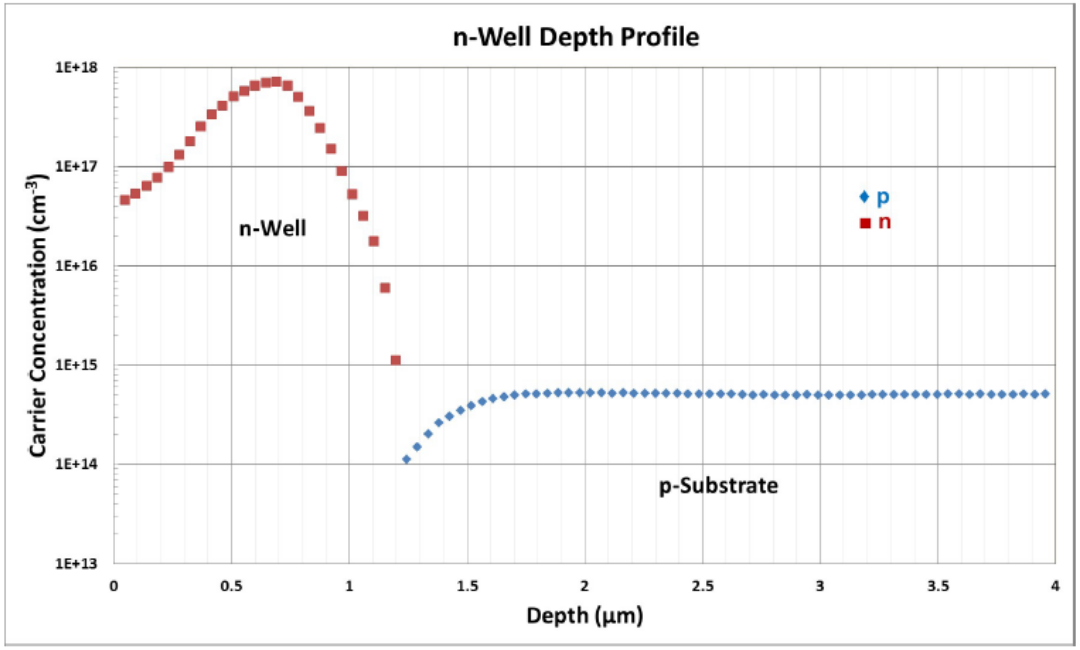
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile The n-well shown above contains the first active region which is n-type.
[Claim 1, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed;	The Western Digital Accused Products include a semiconductor device comprising a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed. For example, a second active region as claimed is shown in the below SEM image (labeled Figure 2.3.4):

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products

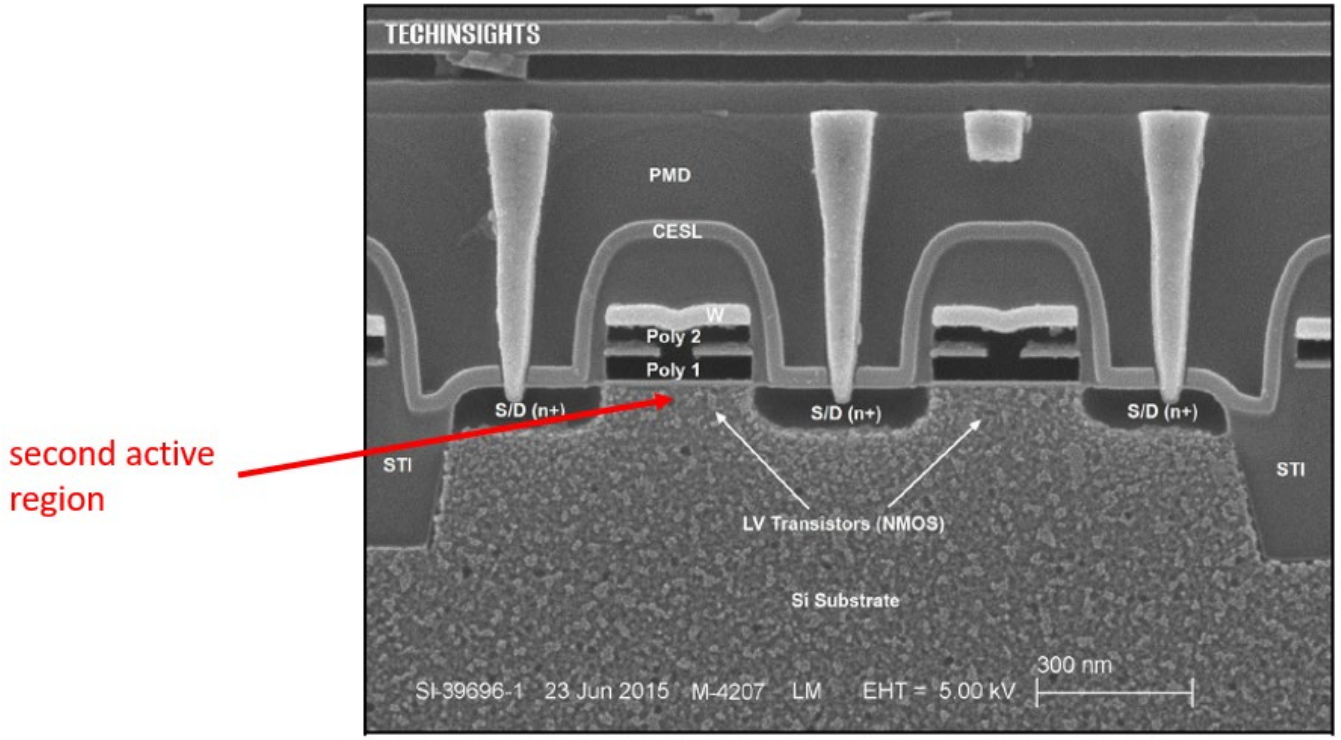
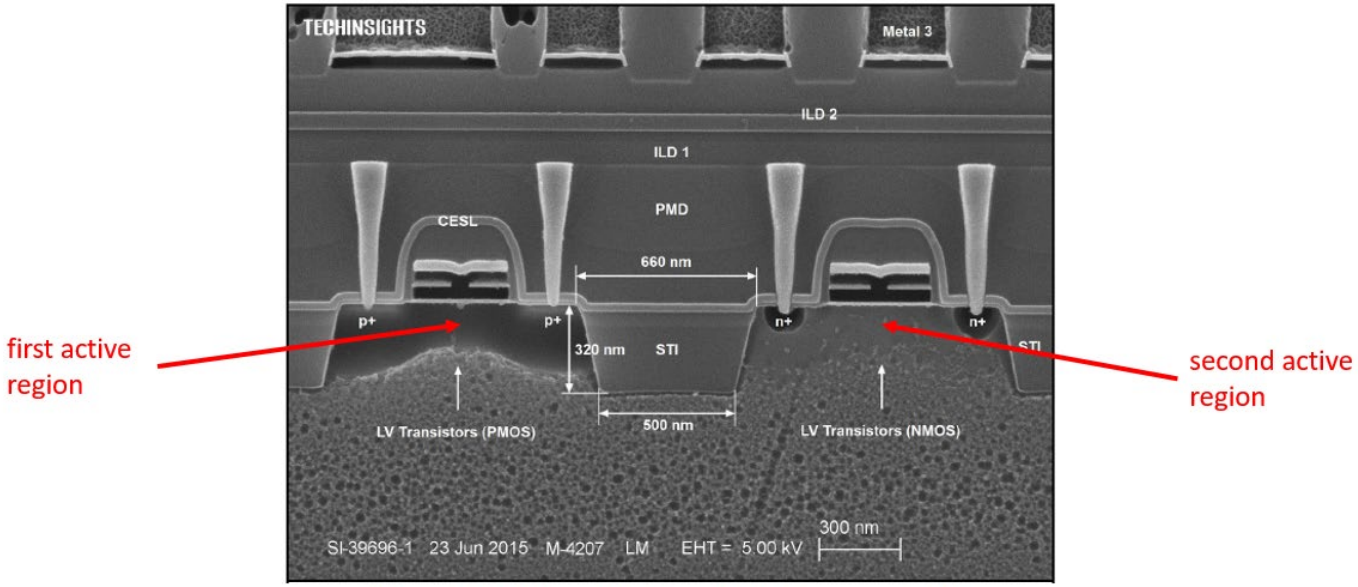


Figure 2.3.4: LV logic NMOS transistors, SEM cross-sectional image with Si etch

An NMOS transistor is shown above the second active region, and thus the second active region is a region within which transistors can be formed. For example, the gate of such a transistor is labeled in the above image.

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.3.9: LV logic NMOS and PMOS transistor, SEM cross-sectional image with Si etch As shown in the above SEM image (labeled Figure 2.3.9), the second active region (which is shown near an NMOS transistor) is separate from the first active region (which is shown near a PMOS transistor) and is disposed adjacent to the first active region.
[Claim 1, Element 4] transistors formed in at least one of the first active region or second active region; and	The Western Digital Accused Products include a semiconductor device comprising transistors formed in at least one of the first active region or second active region. *See* above at Elements 2-3.
[Claim 1, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the first surface to the second surface of the substrate.	The Western Digital Accused Products include a semiconductor device comprising at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the first surface to the second surface of the substrate. For example, spreading resistance profiling (SRP) analysis shows a graded dopant concentration, as explained below. SRP and SIMS are well-known methods of studying semiconductor devices. *See e.g.*, T. Clarysse, et al. *Characterization of electrically active dopant profiles with the spreading resistance probe*, Materials Science and Engineering (December 2004). SRP provides an "electrical depth profile" and "gives intrinsically electrical information." *Id.* at 141, 157. Each SRP data point reflects carrier movement and dopant concentration at the physical location at which it was taken. The plots of SRP data taken from accused products shown herein demonstrate differences in carrier concentration as a function of depth, which generate electric fields within the accused products. That is the SRP plots included in Greenthread's infringement charts evidence both dopant gradients and the corresponding vertical electric drift fields. A silicon sample may be polished at an angle toward the top surface, and a defined profile may be generated over the depth of the sample via the grinding angle. The polished section was then electrically characterized using a

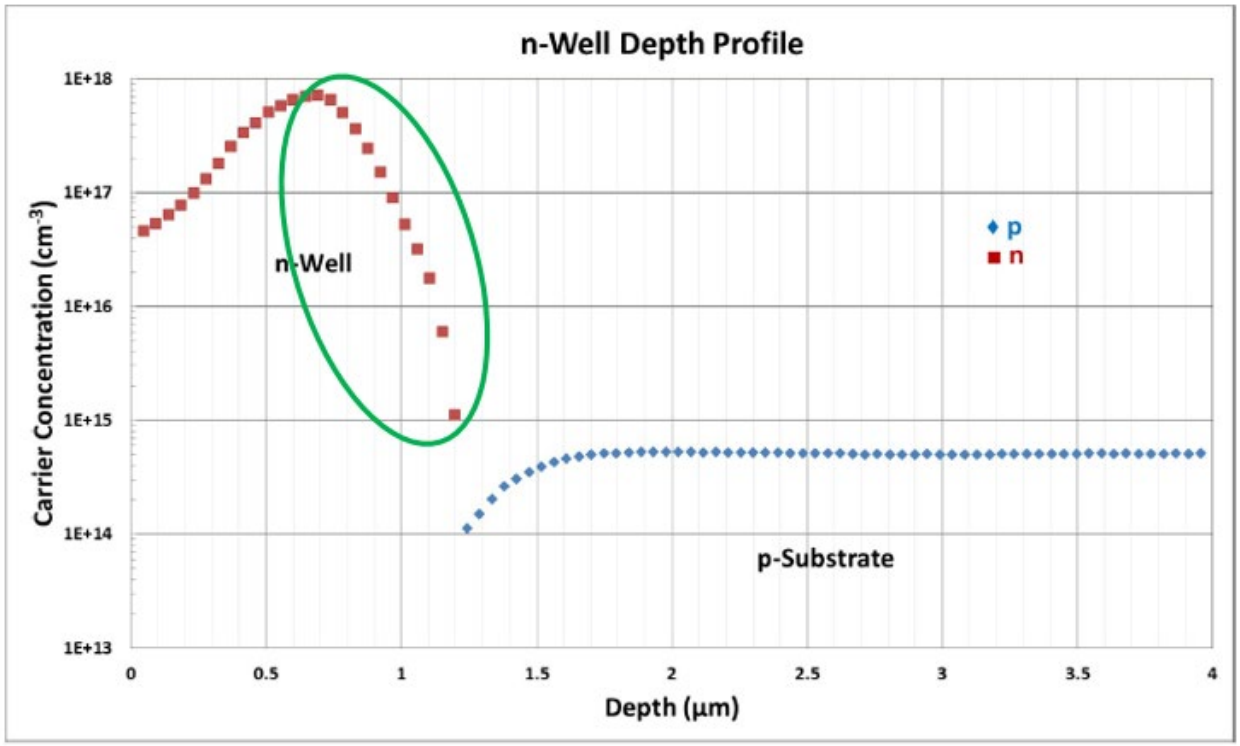
U.S. Patent No. 10,510,842	Accused Products
	step prober, which generated a depth profile. For example, the graphs below, obtained via SRP analysis electrically characterizing the Western Digital Accused Products, show a graded dopant concentration (annotated with green oval) in the first active region (e.g., as shown by the concentration corresponding to an n-well in the first graph below) and in the second active region (e.g., as shown by the concentration corresponding to a p-well in the second graph below) to aid carrier movement from the first surface to the second surface of the substrate (e.g., downwards, corresponding to increasing depth, in the below graphs).  Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile

Exhibit A-1 to Greenthread's Complaint

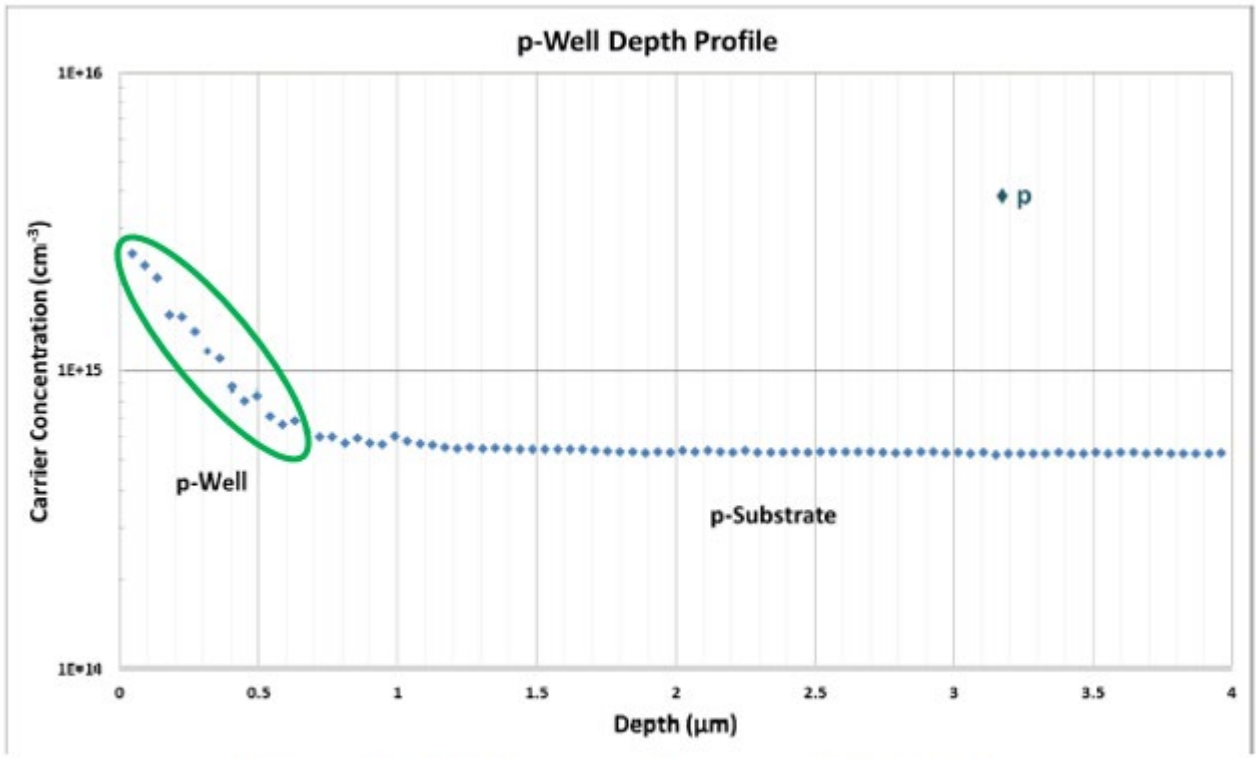
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.1.5: Periphery p-well in n-doped Si substrate, spreading resistance profile
2. The semiconductor device of claim 1, wherein the substrate is a p-type substrate.	The substrate of the semiconductor device of the Western Digital Accused Products is a p-type substrate, as discussed above for Claim 1, Element 1.
4. The semiconductor device of claim 1, wherein the substrate has epitaxial silicon on top of a nonepitaxial substrate.	The substrate of the semiconductor device of the Western Digital Accused Products has epitaxial silicon on top of a nonepitaxial substrate. Upon information and belief, the substrate used in the Western Digital Accused Products is a single-crystal silicon wafer. Additionally, SRP analysis shows a curve downwards in the below blue (corresponding to substrate) plot (from 1.7 µm towards shallower depths) indicative of a purer layer grown on the substrate, and this is likely implemented via epitaxy.

Exhibit A-1 to Greenthread's Complaint

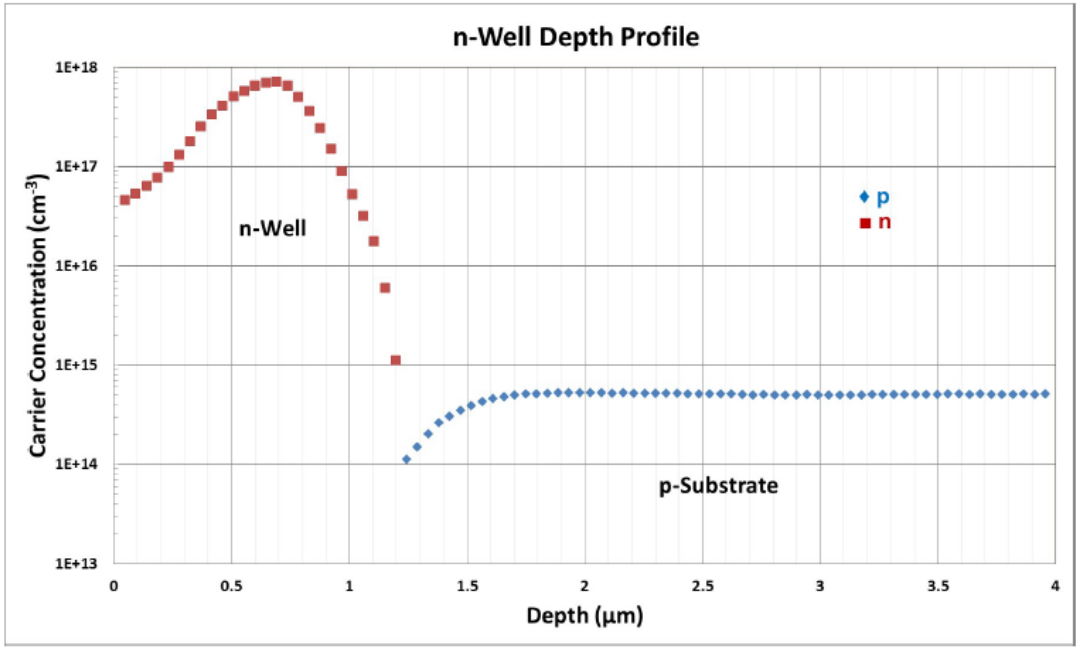
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile
5. The semiconductor device of claim 1, wherein the first active region and second active region contain one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. For example, in the following SEM image, the first and second active regions correspond to PMOS and NMOS transistors, respectively, e.g., as shown in the following SEM images (labeled Figures 2.3.14 and 2.3.15; *see also* above at Claim 1, Elements 2-3).

Exhibit A-1 to Greenthread's Complaint

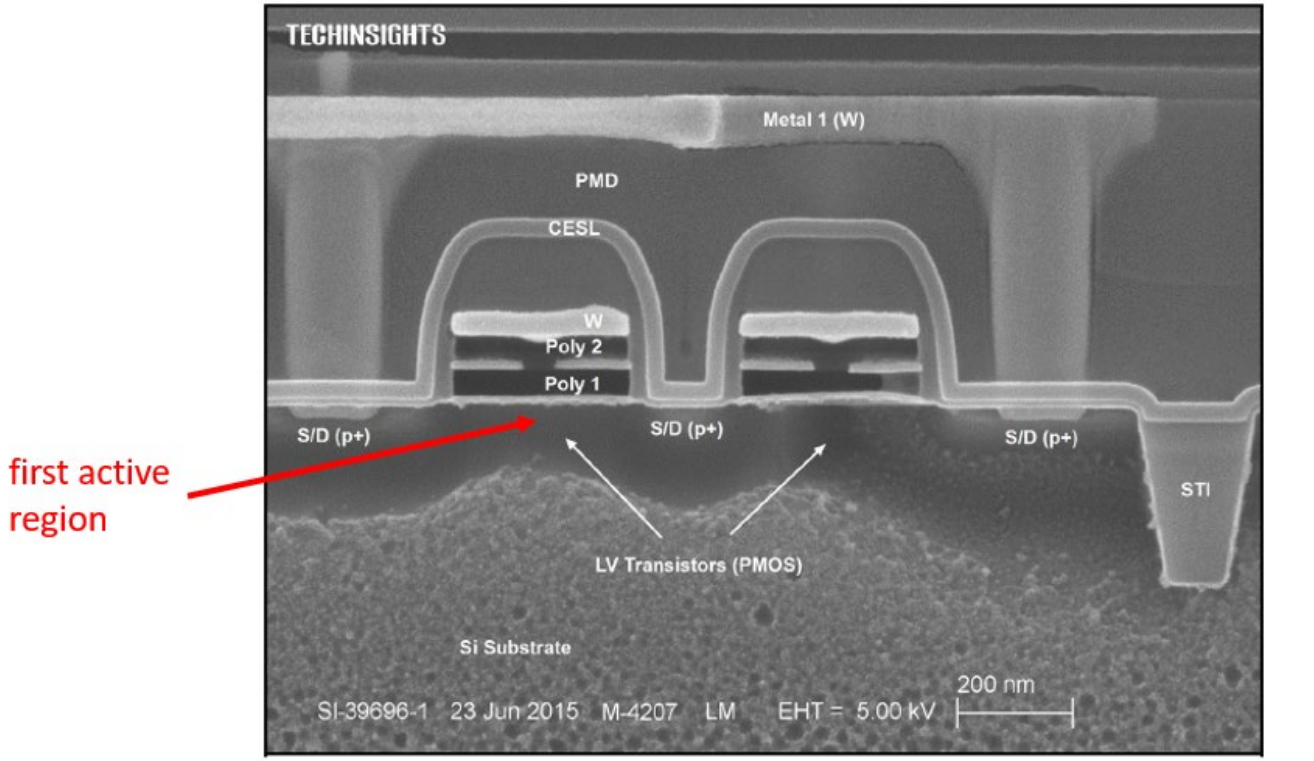
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.3.5: LV logic PMOS transistors, SEM cross-sectional image with Si etch

Exhibit A-1 to Greenthread's Complaint

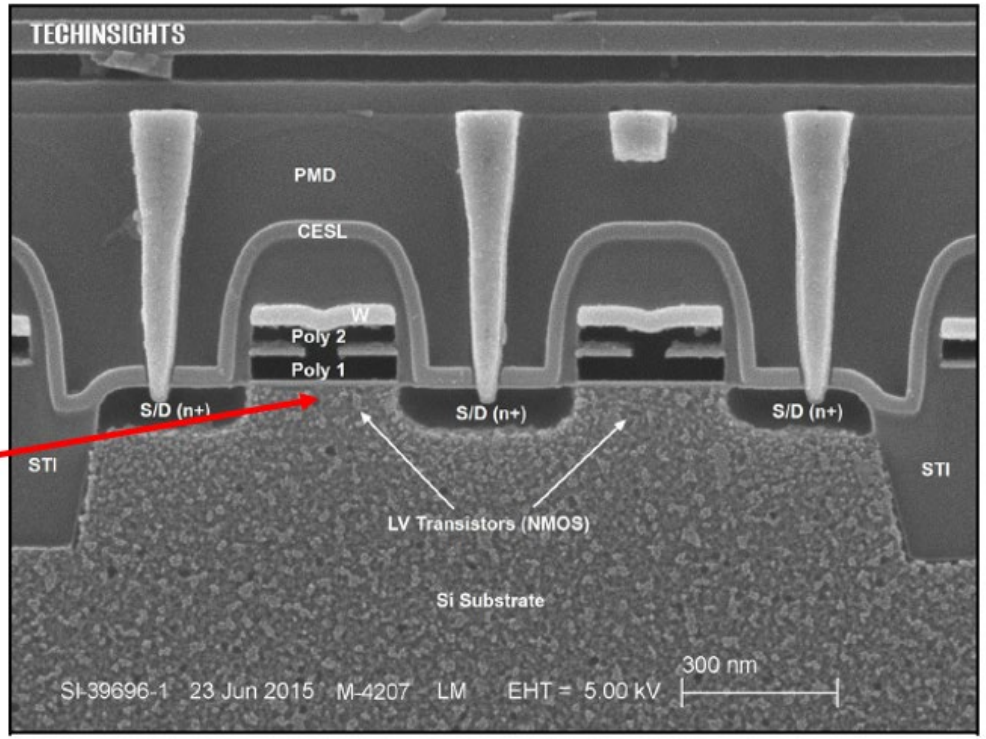
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.3.4: LV logic NMOS transistors, SEM cross-sectional image with Si etch Thus, the first active region and second active region contain one of either p-channel and n-channel devices (e.g., the first active region contains a p-channel device, and the second active region contains an n-channel device).
6. The semiconductor device of claim 1, wherein the first active region and second active region contain either p-channel or n-channel devices in n-wells or p-wells, respectively, and each well has a graded dopant.	The Western Digital Accused Products meet this limitation. As discussed above for Claim 5, the periphery (region with peripheral NMOS and PMOS transistors shown in Figures 2.3.4 and 2.3.5) contains NMOS (n-channel) and PMOS (p-channel) devices in respective p-wells and n-wells. As discussed above for Claim 1, Elements 2-3 and Claim 5, the p-channel and n-channel devices are contained in the first and active regions (*see* annotated Figures 2.3.4 and 2.3.5 discussed above). The following graphs obtained via SRP analysis show a p-well having a graded dopant (e.g., depths from 0 to about 0.8 µm in first graph below) and an n-well having a graded dopant (e.g., depths of about 0.7-1.2 µm in second graph below).

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products

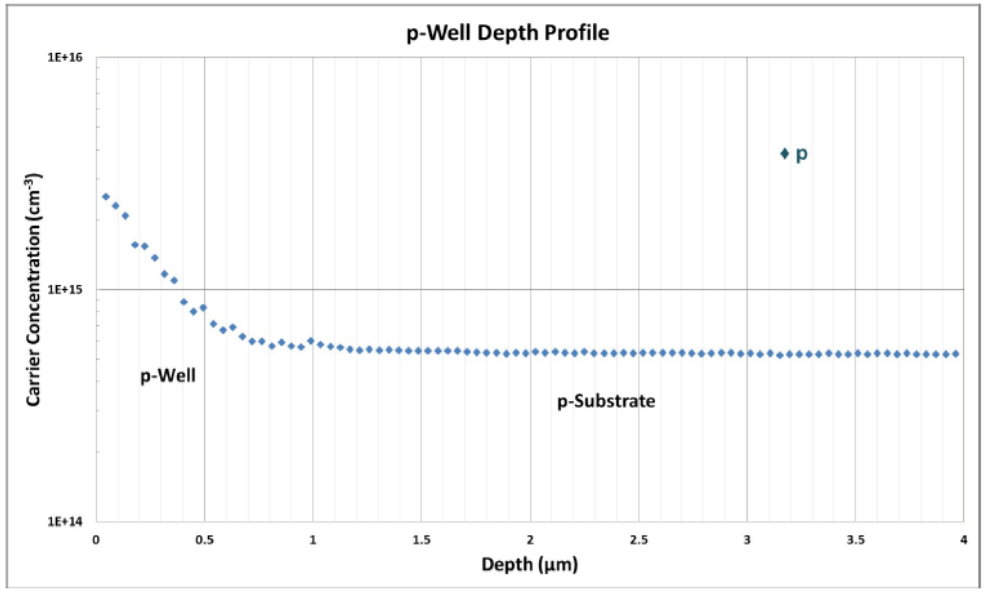


Figure 2.1.5: Periphery p-well in n-doped Si substrate, spreading resistance profile

Exhibit A-1 to Greenthread's Complaint

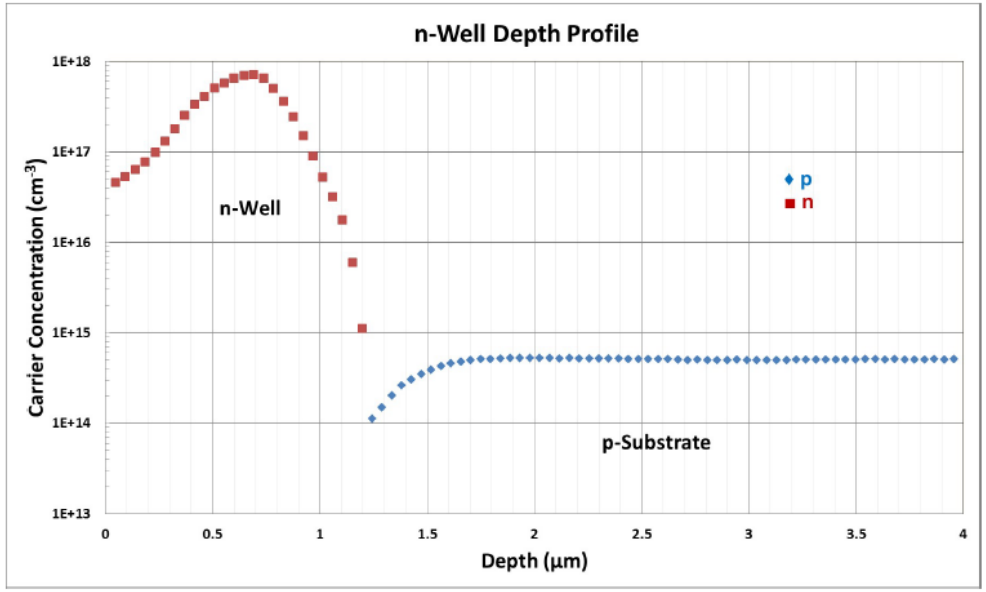
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile The first and second active regions contain either p-channel or n-channel devices in these n-wells/p-wells because in CMOS technology a p-channel device is formed in an n-well and an n-channel device is formed in a p-well.
7. The semiconductor device of claim 1, wherein the first active region and second active region are each separated by at least one isolation region.	The Western Digital Accused Products meet this limitation. The following SEM cross-sectional image shows that the first active region and second active region are each separated by at least one isolation region, which is a shallow-trench isolation as indicated by the label STI (annotated below with red oval).

Exhibit A-1 to Greenthread's Complaint

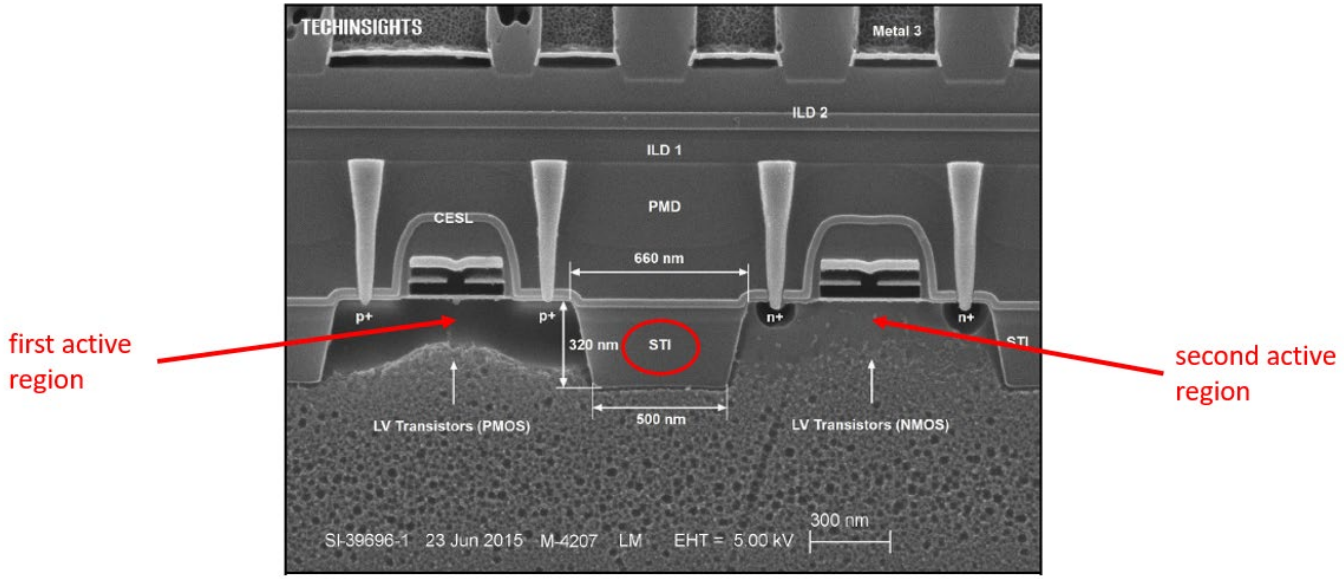
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.3.9: LV logic NMOS and PMOS transistor, SEM cross-sectional image with Si etch
8. The semiconductor device of claim 1, wherein the graded dopant is fabricated with an ion implantation process.	Upon information and belief, the graded dopant is fabricated with an ion implantation process. For example, ion implantation is the prevalent process for implementing doping in semiconductor devices, and is believed to be used for the Western Digital Accused Products. Information about the fabrication process for Western Digital Accused Products, including usage of an ion implantation process, is in the possession of the Defendants and is expected to be obtained through discovery.
[Claim 9, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* above at Claim 1, Preamble.
[Claim 9, Element 1] a substrate of a first doping type at a first doping level having first and second surfaces;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1.
[Claim 9, Element 2] a first active region disposed adjacent the first surface of the substrate with a second doping type opposite in	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 2. Upon information and belief, transistors can be formed in the surface of the first active region. Details regarding formation of transistors are in the possession of the Defendants and are expected to be obtained through discovery.

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products
conductivity to the first doping type and within which transistors can be formed in the surface thereof;	
[Claim 9, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed in the surface thereof;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 3. Upon information and belief, transistors can be formed in the surface of the second active region. Details regarding formation of transistors are in the possession of the Defendants and are expected to be obtained through discovery.
[Claim 9, Element 4] transistors formed in at least one of the first active region or second active region; and	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 4.
[Claim 9, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the surface to the substrate.	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 5 SRP analysis electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Claim 1, Element 5.
10. The semiconductor device of claim 9, wherein the substrate is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* above at Claim 2.
12. The semiconductor device of claim 9, wherein the substrate has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* above at Claim 4.
13. The semiconductor device of claim 9, wherein the first active region and second active region contain at least one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. *See* above at Claim 5.
14. The semiconductor device of claim 9, wherein the first active	The Western Digital Accused Products meet this limitation. *See* above at Claim 6.

Exhibit A-1 to Greenthread's Complaint

U.S. Patent No. 10,510,842	Accused Products
region and second active region contain either p-channel or n-channel devices in n-wells or p-wells, respectively, and each well has a graded dopant.	
15. The semiconductor device of claim 9, wherein the first active region and second active region are each separated by at least one isolation region.	Upon information and belief, the Western Digital Accused Products meet this limitation. *See* above at Claim 7.
16. The semiconductor device of claim 9, wherein the graded dopant is fabricated with an ion implantation process.	Upon information and belief, the Western Digital Accused Products meet this limitation. *See* above at Claim 8.
17. The semiconductor device of claim 1, wherein the first and second active regions are formed adjacent the first surface of the substrate.	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Elements 2-3.
18. The semiconductor device of claim 1, wherein the transistors which can be formed in the first and second active regions are CMOS transistors requiring a source, a drain, a gate and a channel region.	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Elements 2-3; Claim 6. The SEM images labeled Figures 2.3.5 and 2.3.4 discussed above for Claim 1, Elements 2-3 and Claim 6 show NMOS and PMOS transistors, which are adjacent to one another as shown in the SEM image labeled Figure 2.3.9 discussed above for Claim 1, Element 3. Therefore, the transistors which can be formed in the first and second active regions are CMOS transistors. CMOS transistors require a source, a drain, a gate, and a channel region. The source and drain terminals of transistors are shown below, a gate is between each source-drain pair, and a channel region connects each source to a corresponding drain.

Exhibit A-1 to Greenthread's Complaint

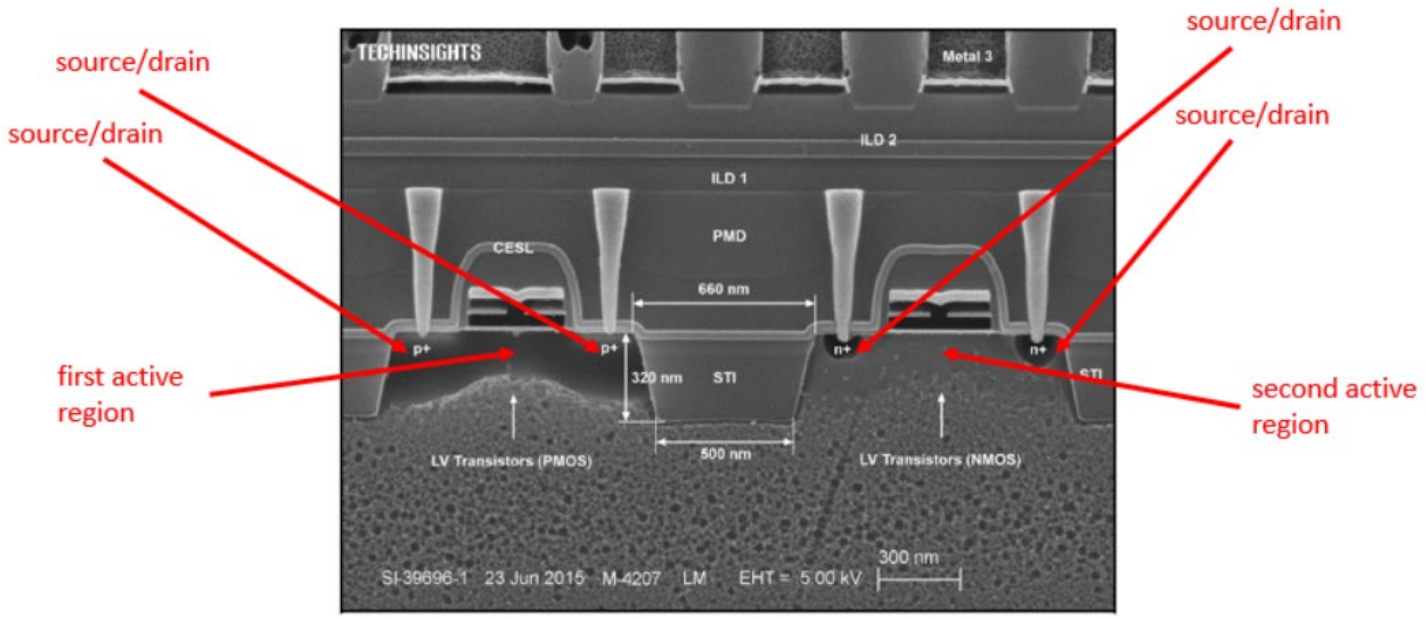
U.S. Patent No. 10,510,842	Accused Products
	 Figure 2.3.9: LV logic NMOS and PMOS transistor, SEM cross-sectional image with Si etch

Exhibit A-2 to Greenthread's Complaint

U.S. Patent No. 10,734,481	Accused Products
[Claim 1, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* Exhibit A-1, Claim 1, Preamble. The SanDisk 15 nm 16 GB NAND flash memory referenced in Exhibit A-1 for tear-down analysis is discussed in this claim chart and other infringement contention claim charts as an example of a flash memory representative of the Western Digital Accused Products. Upon information and belief, such a SanDisk flash memory is representative of flash memory devices used in the Western Digital Accused Products for purposes of this claim chart and the other infringement contention claim charts because, e.g., other flash memory devices used in Western Digital Accused Products would have similarly been advantageously designed to move carriers (e.g., towards the substrate) and achieve the performance enhancements described and claimed in the '481 patent (and the other asserted patents). For example, other flash memory devices would similarly have been designed with a dopant gradient in order to improve performance characteristics such as on and off switching times and other performance enhancements described in the Abstract of the '481 patent (and the other asserted patents). Therefore, upon information and belief, other flash memory devices used in Western Digital Accused Products contain similar features as the SanDisk 16 nm 16 GB NAND flash memory, and function in a similar way, with respect to the features claimed in the asserted claims. This claim chart is based on publicly available information, and additional information regarding these and other accused products is expected to be obtained through discovery.
[Claim 1, Element 1] a substrate of a first doping type at a first doping level having first and second surfaces;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 1.
[Claim 1, Element 2] a first active region disposed adjacent the first surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 2.
[Claim 1, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 3.
[Claim 1, Element 4] transistors formed in at least one of the first active region or second active region;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.

Exhibit A-2 to Greenthread's Complaint

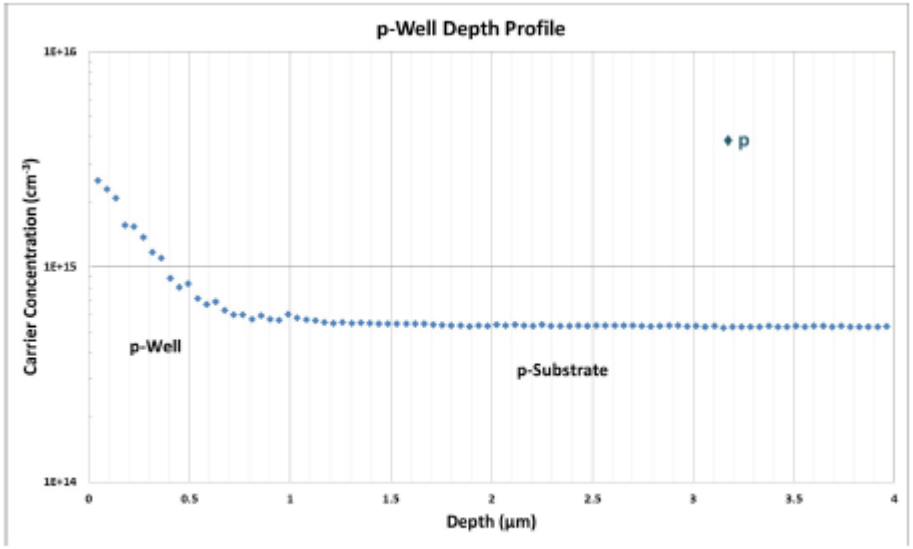
U.S. Patent No. 10,734,481	Accused Products
[Claim 1, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the first surface to the second surface of the substrate; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 5 SRP analysis electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 1, Element 6] at least one well region adjacent to the first or second active region containing at least one graded dopant region, the graded dopant region to aid carrier movement from the first surface to the second surface of the substrate.	The Western Digital Accused Products meet this limitation. For example, the SanDisk flash memory includes a p-well (first graph below) and an n-well (second graph below) having graded dopant regions.  Figure 2.1.5: Periphery p-well in n-doped Si substrate, spreading resistance profile

Exhibit A-2 to Greenthread's Complaint

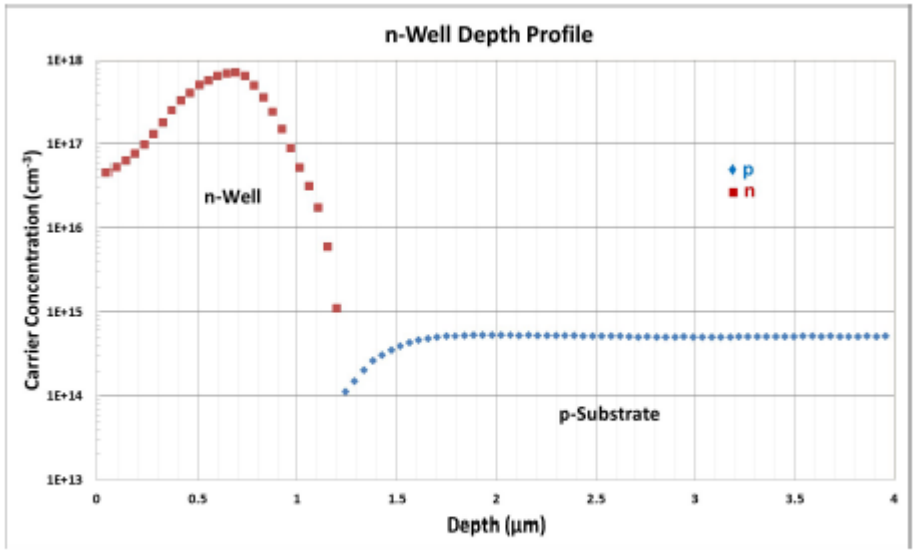
U.S. Patent No. 10,734,481	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile These graded dopant regions are to aid carrier movement from the first surface to the second surface of the substrate. *See* Exhibit A-1, Claim 1, Element 5. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
2. The semiconductor device of claim 1, wherein the substrate is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 2.
3. The semiconductor device of claim 1, wherein the substrate has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 4.
4. The semiconductor device of claim 1, wherein the first active region and second active region contain one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 5.
5. The semiconductor device of claim 1, wherein the first active	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 6.

Exhibit A-2 to Greenthread's Complaint

U.S. Patent No. 10,734,481	Accused Products
region and second active region contain either p-channel or n-channel devices in n-wells or p-wells, respectively, and each well has at least one graded dopant.	
6. The semiconductor device of claim 1, wherein the first active region and second active region are each separated by at least one isolation region.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 7.
7. The semiconductor device of claim 1, wherein the graded dopant is fabricated with an ion implantation process.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 8.
8. The semiconductor device of claim 1, wherein the first and second active regions are formed adjacent the first surface of the substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Elements 1-3.
9. The semiconductor device of claim 1, wherein dopants of the graded dopant concentration in the first active region or the second active region are either p-type or n-type.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 5 (SRP analysis of Figures 2.1.4 and 2.1.5 (below) showing n-type doping and p-type doping, respectively, at graded dopant concentration).

Exhibit A-2 to Greenthread's Complaint

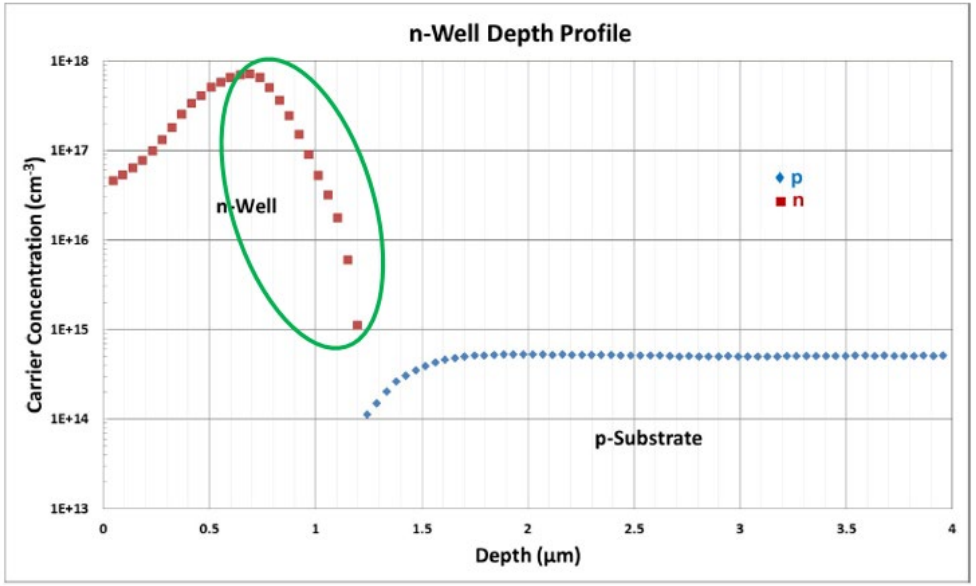
U.S. Patent No. 10,734,481	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile

Exhibit A-2 to Greenthread's Complaint

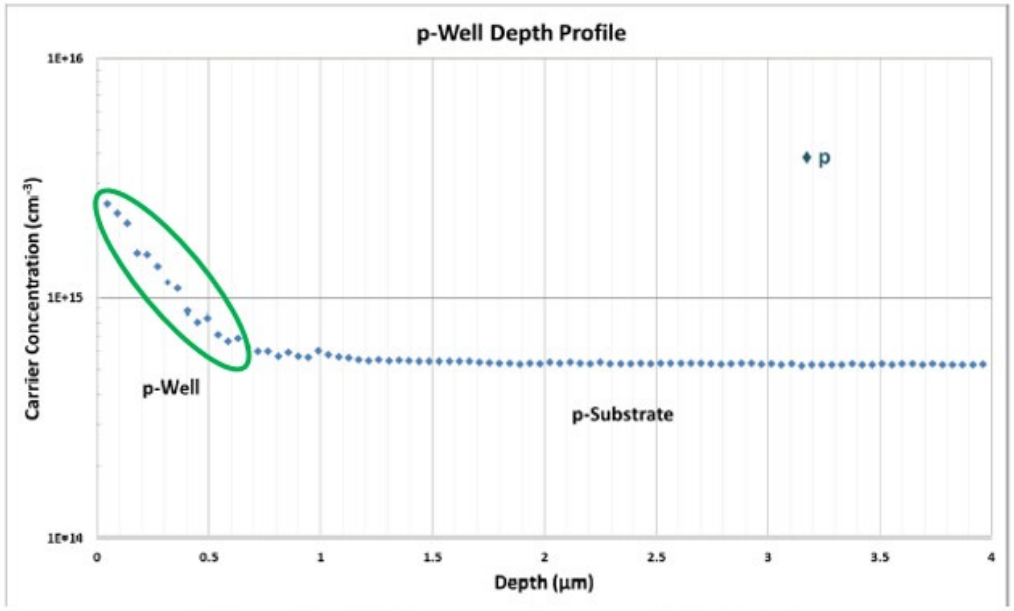
U.S. Patent No. 10,734,481	Accused Products
	 Figure 2.1.5: Periphery p-well in n-doped Si substrate, spreading resistance profile
13. The semiconductor device of claim 1, wherein the transistors which can be formed in the first and second active regions are CMOS transistors requiring at least a source, a drain, a gate and a channel.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 18.
15. The semiconductor device of claim 1, wherein the device is a complementary metal oxide semiconductor (CMOS) with a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claims 4 (regarding nonepitaxial substrate), 18 (regarding CMOS).
16. The semiconductor device of claim 1, wherein the device is a flash memory.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Preamble.

Exhibit A-2 to Greenthread's Complaint

U.S. Patent No. 10,734,481	Accused Products
[Claim 20, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products meet include a semiconductor device. *See* above at Claim 1, Preamble.
[Claim 20, Element 1] a substrate of a first doping type at a first doping level having first and second surfaces;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 1.
[Claim 20, Element 2] a first active region disposed adjacent the first surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed in the surface thereof;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 9, Element 2.
[Claim 20, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed in the surface thereof;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 9, Element 3.
[Claim 20, Element 4] transistors formed in at least one of the first active region or second active region;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.
[Claim 20, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the surface to the substrate; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 5. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 20, Element 6] at least one well region adjacent to the first or second active region containing at least one graded dopant region, the graded dopant region to aid carrier	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 6. *See also* SRP analysis reproduced at Exhibit A-1 Claim 1 Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

Exhibit A-2 to Greenthread's Complaint

U.S. Patent No. 10,734,481	Accused Products
movement from the first surface to the second surface of the substrate.	
22. The semiconductor device of claim 20, wherein the substrate is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 2.
23. The semiconductor device of claim 20, wherein the substrate has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 4.
24. The semiconductor device of claim 20, wherein the first active region and second active region contain at least one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 5.
25. The semiconductor device of claim 20, wherein the first active region and second active region contain either p-channel or n-channel devices in n-wells or p-wells, respectively, and each well has at least one graded dopant.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 6.
26. The semiconductor device of claim 20, wherein the first active region and second active region are each separated by at least one isolation region.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 7.
27. The semiconductor device of claim 20, wherein dopants of the graded dopant concentration in the first active region or the second active region are either p-type or n-type.	The Western Digital Accused Products meet this limitation. *See* above at Claim 9.

Exhibit A-2 to Greenthread's Complaint

U.S. Patent No. 10,734,481	Accused Products
31. The semiconductor device of claim 20, wherein the graded dopant is fabricated with an ion implantation process.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 8.
32. The semiconductor device of claim 20, wherein the substrate is a complementary metal oxide semiconductor (CMOS) device.	The Western Digital Accused Products meet this limitation. *See* above at Claim 15.
33. The semiconductor device of claim 20, wherein the device is a flash memory.	The Western Digital Accused Products meet this limitation. *See* above at Claim 16.

Exhibit A-3 to Greenthread's Complaint

U.S. Patent No. 11,121,222	Accused Products
[Claim 1, Preamble] A VLSI semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a VLSI semiconductor device. The SanDisk flash memory discussed for claim 1 of Exhibit A-1 is a semiconductor device (*see* Exhibit A-1, Claim 1, Preamble) with millions of transistors, and is a VLSI semiconductor device upon information and belief. Details regarding transistor count are in the possession of the Defendants and are expected to be obtained through discovery. The SanDisk 15 nm 16 GB NAND flash memory referenced in Exhibit A-1 is discussed in this claim chart and other infringement contention claim charts as an example of a flash memory representative of the Western Digital Accused Products. Upon information and belief, such a SanDisk flash memory is representative of flash memory devices used in the Western Digital Accused Products for purposes of this claim chart and the other infringement contention claim charts because, e.g., other flash memory devices used in Western Digital Accused Products would have similarly been advantageously designed to move carriers (e.g., towards the substrate) and achieve the performance enhancements described and claimed in the '222 patent (and the other asserted patents). For example, other flash memory devices would similarly have been designed with a dopant gradient in order to improve performance characteristics such as on and off switching times and other performance enhancements described in the Abstract of the '222 patent (and the other asserted patents). Therefore, upon information and belief, other flash memory devices used in Western Digital Accused Products contain similar features as the SanDisk 15 nm 16 GB NAND flash memory, and function in a similar way with respect to the features claimed in the asserted claims. This claim chart is based on publicly available information, and additional information regarding these and other accused products is expected to be obtained through discovery.
[Claim 1, Element 1] a substrate of a first doping type at a first doping level having a surface;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 1.

Exhibit A-3 to Greenthread's Complaint

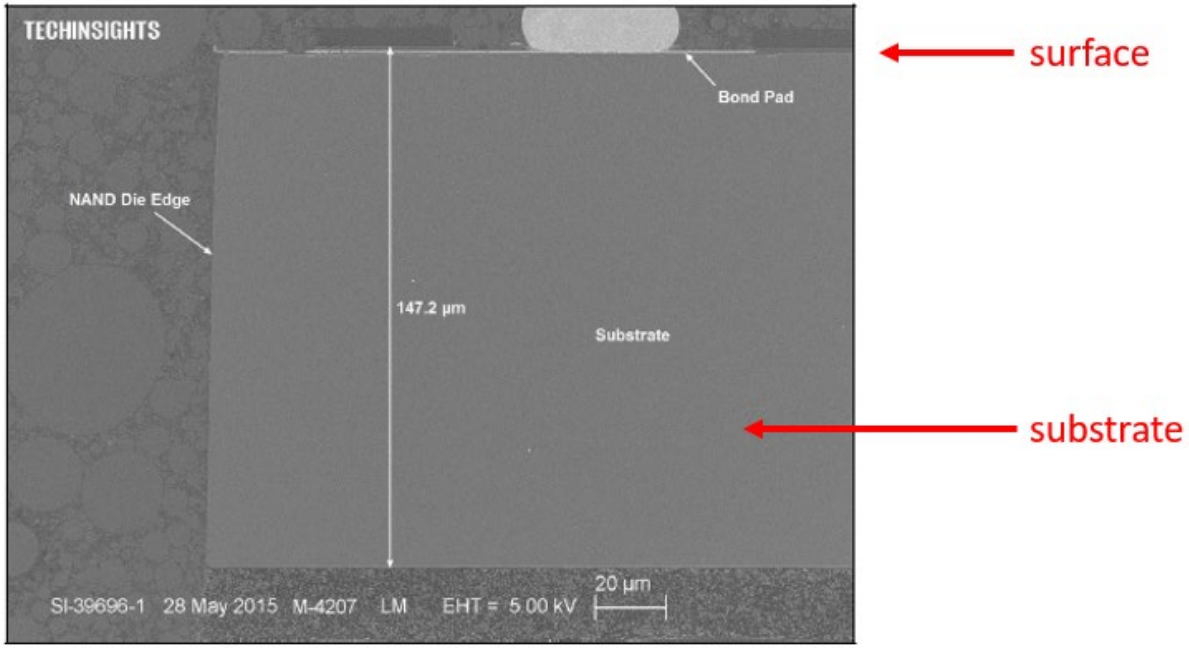
U.S. Patent No. 11,121,222	Accused Products
	 Figure 1.2.3: Die thickness, SEM cross-sectional image
[Claim 1, Element 2] a first active region disposed adjacent the surface with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 2.
[Claim 1, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 3.

Exhibit A-3 to Greenthread's Complaint

U.S. Patent No. 11,121,222	Accused Products
[Claim 1, Element 4] transistors formed in at least one of the first active region or second active region;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.
[Claim 1, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the first and second active regions towards an area of the substrate where there are no active regions; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 5. For example, referencing the SRP graph discussed at Exhibit A-1, Claim 1, Element 5, there are no active regions at depths of about 1.3 µm and greater. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 1, Element 6] at least one well region adjacent to the first or second active region containing at least one graded dopant region, the graded dopant region to aid carrier movement from the surface towards the area of the substrate where there are no active regions, wherein at least some of the transistors form digital logic of the VLSI semiconductor device.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 1, Element 6. Upon information and belief, at least some of the transistors form digital logic of the VLSI semiconductor device. For example, transistors are commonly used to implement digital logic, e.g., for controlling access to memory components/functionality. Details regarding transistors in the Western Digital Accused Products are in the possession of the Defendants and are expected to be obtained through discovery. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
2. The VLSI semiconductor device of claim 1, wherein the substrate is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 2.
3. The VLSI semiconductor device of claim 1, wherein the substrate has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 4.
4. The VLSI semiconductor device of claim 1, wherein the first active region and second	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 5; Exhibit A-2, Claim 4. Upon information and belief, the first and second active regions contain digital logic as claimed. *See* above at Claim 1, Element 6.

Exhibit A-3 to Greenthread's Complaint

U.S. Patent No. 11,121,222	Accused Products
active region contain digital logic formed by one of either p-channel and n-channel devices.	
5. The VLSI semiconductor device of claim 1, wherein the first active region and second active region contain either p-channel or n-channel devices in n−wells or p−wells, respectively, and each well has at least one graded dopant.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 6.
6. The VLSI semiconductor device of claim 1, wherein the first active region and second active region are each separated by at least one isolation region.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 7.
7. The VLSI semiconductor device of claim 1, wherein the graded dopant is fabricated with an ion implantation process.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 8.
8. The VLSI semiconductor device of claim 1, wherein the first and second active regions are formed adjacent the first surface of the substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Elements 1-3.
9. The VLSI semiconductor device of claim 1, wherein dopants of the graded dopant concentration in the first active region or the second active region are either p-type or n-type.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 9.
13. The VLSI semiconductor device of claim 1, wherein the	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 13. Upon information and belief, the transistors which can be formed in the first and second active regions are CMOS digital logic transistors as claimed. *See* above at Claim 1, Element 6.

Exhibit A-3 to Greenthread's Complaint

U.S. Patent No. 11,121,222	Accused Products
transistors which can be formed in the first and second active regions are CMOS digital logic transistors requiring at least a source, a drain, a gate and a channel.	
15. The VLSI semiconductor device of claim 1, wherein the device is a complementary metal oxide semiconductor (CMOS) with a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 15.
16. The VLSI semiconductor device of claim 1, wherein the device is a flash memory.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 16.
17. The VLSI semiconductor device of claim 1, wherein the device comprises digital logic and capacitors.	The Western Digital Accused Products meet this limitation. Upon information and belief, the semiconductor device comprises digital logic and capacitors. *See* above at Claim 1, Element 6 (discussion regarding digital logic). Details regarding digital logic and capacitors in the Western Digital Accused Products are in the possession of the Defendants and are expected to be obtained through discovery.
20. The VLSI semiconductor device of claim 1, wherein each of the first and second active regions are in the lateral or vertical direction.	The Western Digital Accused Products meet this limitation. As shown by SEM imaging (*see* Exhibit A-1, Claim 1, Elements 1-3), each of the first and second active regions are in the lateral or vertical direction.
[Claim 21, Preamble] A VLSI semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* above at Claim 1, Preamble.
[Claim 21, Element 1] a substrate of a first doping type at a first doping level having a surface;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1.
[Claim 21, Element 2] a first active region disposed adjacent the surface of the substrate with a second doping type opposite in	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 9, Element 2.

Exhibit A-3 to Greenthread's Complaint

U.S. Patent No. 11,121,222	Accused Products
conductivity to the first doping type and within which transistors can be formed in the surface thereof;	
[Claim 21, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed in the surface thereof;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 9, Element 3.
[Claim 21, Element 4] transistors formed in at least one of the first active region or second active region;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.
[Claim 21, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the surface to an area of the substrate where there are no active regions; and	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 5. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 21, Element 6] at least one well region adjacent to the first or second active region containing at least one graded dopant region, the graded dopant region to aid carrier movement from the surface to the area of the substrate where there are no active regions, and wherein the graded dopant concentration is linear, quasilinear, error function, complementary error function, or any combination thereof.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 1, Element 6. As shown by SRP analysis (*see* Exhibit A-1, Claim 1, Element 1), the graded dopant concentration is linear, quasilinear, error function, complementary error function, or any combination thereof. For example, the quasilinear nature of the concentration is shown in the SRP graph discussed at Exhibit A-1, Claim 1, Element 5. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

Exhibit A-3 to Greenthread's Complaint

U.S. Patent No. 11,121,222	Accused Products
23. The VLSI semiconductor device of claim 21, wherein the substrate is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 2.
24. The VLSI semiconductor device of claim 21, wherein the substrate has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 4.
25. The VLSI semiconductor device of claim 21, wherein the first active region and second active region contain at least one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 5.
26. The VLSI semiconductor device of claim 21, wherein the first active region and second active region contain either p-channel or n-channel devices in n−wells or p−wells, respectively, and each well has at least one graded dopant.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 6.
27. The VLSI semiconductor device of claim 21, wherein the first active region and second active region are each separated by at least one isolation region.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 7.
28. The VLSI semiconductor device of claim 21, wherein dopants of the graded dopant concentration in the first active region or the second active region are either p-type or n-type.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 9.
32. The VLSI semiconductor device of claim 21, wherein the	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 8.

Exhibit A-3 to Greenthread's Complaint

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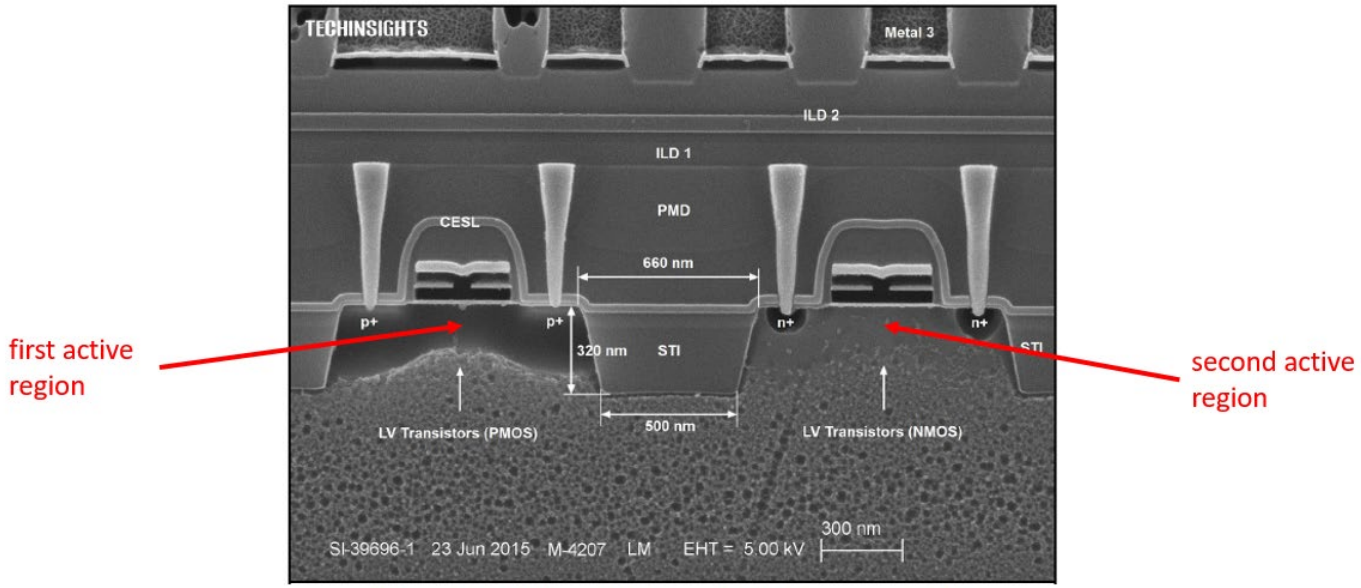
graded dopant is fabricated with an ion implantation process.	
33. The VLSI semiconductor device of claim 21, wherein the substrate is a complementary metal oxide semiconductor (CMOS) device.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 15.
34. The VLSI semiconductor device of claim 21, wherein the device is a flash memory.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 16.
38. The VLSI semiconductor device of claim 21, wherein each of the first and second active regions are in the lateral or vertical direction.	The Western Digital Accused Products meet this limitation. As shown by SEM imaging (*see* Figure 2.3.9 shown below and discussed at Exhibit A-1, Claim 1, Element 3), each of the first and second active regions are in the lateral or vertical direction.  Figure 2.3.9: LV logic NMOS and PMOS transistor, SEM cross-sectional image with Si etch

Exhibit A-3 to Greenthread's Complaint

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[Claim 39, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* Exhibit A-1, Claim 1, Preamble.
[Claim 39, Element 1] a substrate of a first doping type at a first doping level;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 1.
[Claim 39, Element 2] a first active region disposed adjacent to a surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 2.
[Claim 39, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 3.
[Claim 39, Element 4] transistors formed in at least one of the first active region or second active region; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.
[Claim 39, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the first or second active region to at least one substrate area where there is no active region.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 5; *see* above at Claim 21, Element 5. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
40. The semiconductor device of claim 39 further comprising at least one well region adjacent to	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 1, Element 6. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

Exhibit A-3 to Greenthread's Complaint

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the first or second active region and containing at least one graded dopant region, the graded dopant region to aid carrier movement from any region in the well to the substrate area where there is no well.	
[Claim 41, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* above at Claim 39, Preamble.
[Claim 41, Element 1] a substrate of a first doping type at a first doping level;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 1.
[Claim 41, Element 2] a first active region disposed adjacent to a surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* above at Claim 39, Element 2.
[Claim 41, Element 3] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* above at Claim 39, Element 3.
[Claim 41, Element 4] transistors formed in at least one of the first active region or second active region; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.
[Claim 41, Element 5] at least a portion of at least one of the first and second active regions having at least one graded dopant acceptor concentration to aid	The Western Digital Accused Products meet this limitation. *See* above at Claim 21, Element 5. The following graph obtained via SRP analysis reveals at least one graded dopant acceptor concentration (e.g., concentration in p-well) as claimed.

Exhibit A-3 to Greenthread's Complaint

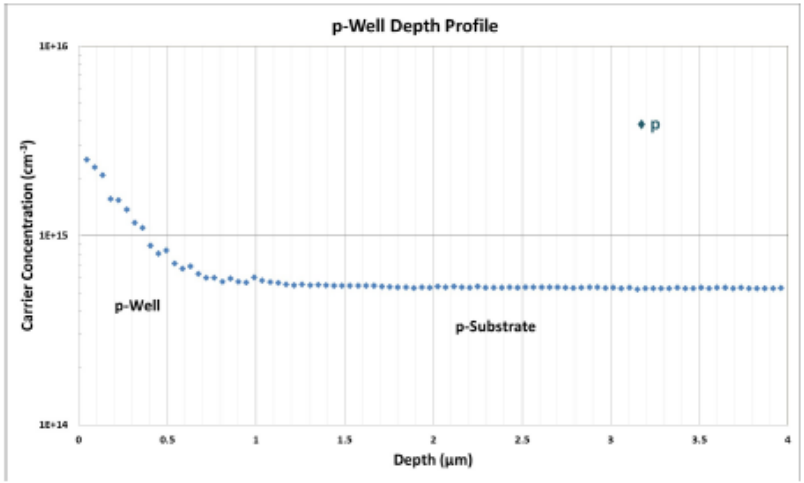
U.S. Patent No. 11,121,222	Accused Products
carrier movement from the first or second active region to at least one substrate area where there is no active region.	 Figure 2.1.5: Periphery p-well in n-doped Si substrate, spreading resistance profile *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 42, Preamble] A semiconductor device, comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* above at Claim 39, Preamble.
[Claim 42, Element 1] a substrate of a first doping type at a first doping level;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 1.
[Claim 42, Element 2] a first active region disposed adjacent to a surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* above at Claim 39, Element 2.
[Claim 42, Element 3] a second active region separate from the first active region	The Western Digital Accused Products meet this limitation. *See* above at Claim 39, Element 3.

Exhibit A-3 to Greenthread's Complaint

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disposed adjacent to the first active region and within which transistors can be formed;	
[Claim 42, Element 4] transistors formed in at least one of the first active region or second active region; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 4.
[Claim 42, Element 5] at least a portion of at least one of the first and second active regions having at least one graded donor dopant concentration to aid carrier movement from the first or second active region to at least one substrate area where there is no active region.	The Western Digital Accused Products meet this limitation. SRP analysis (*see* Exhibit A-1, Claim 1, Element 5) reveals at least one graded dopant acceptor concentration (e.g., concentration in n-well) as claimed. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 44, Preamble] A CMOS Semiconductor device comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a CMOS Semiconductor device. *See* Exhibit A-1, Claim 1, Preamble; Exhibit A-1, Claim 18.
[Claim 44, Element 1]: a surface layer;	The Western Digital Accused Products meet this limitation. *See* above at Claim 21, Element 1.

Exhibit A-3 to Greenthread's Complaint

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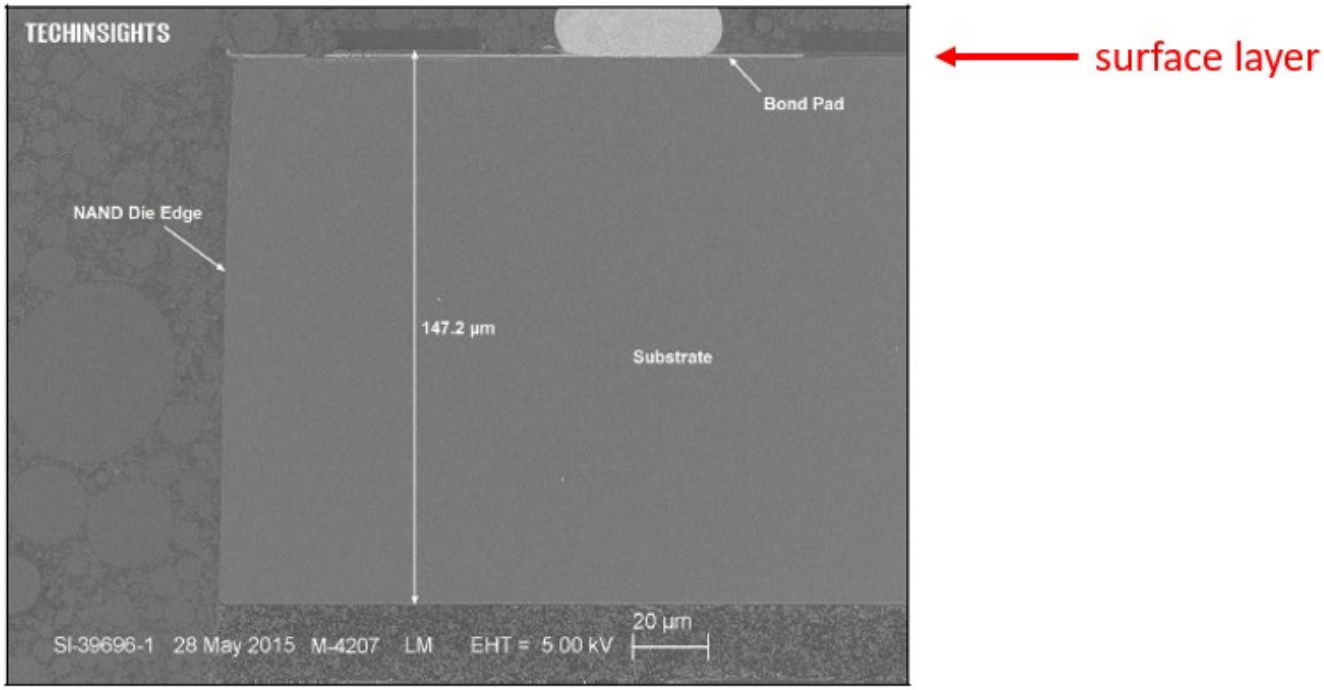
	 Figure 1.2.3: Die thickness, SEM cross-sectional image
[Claim 44, Element 2] a substrate;	The Western Digital Accused Products meet this limitation. *See* above at Claim 44, Element 1.

Exhibit A-3 to Greenthread's Complaint

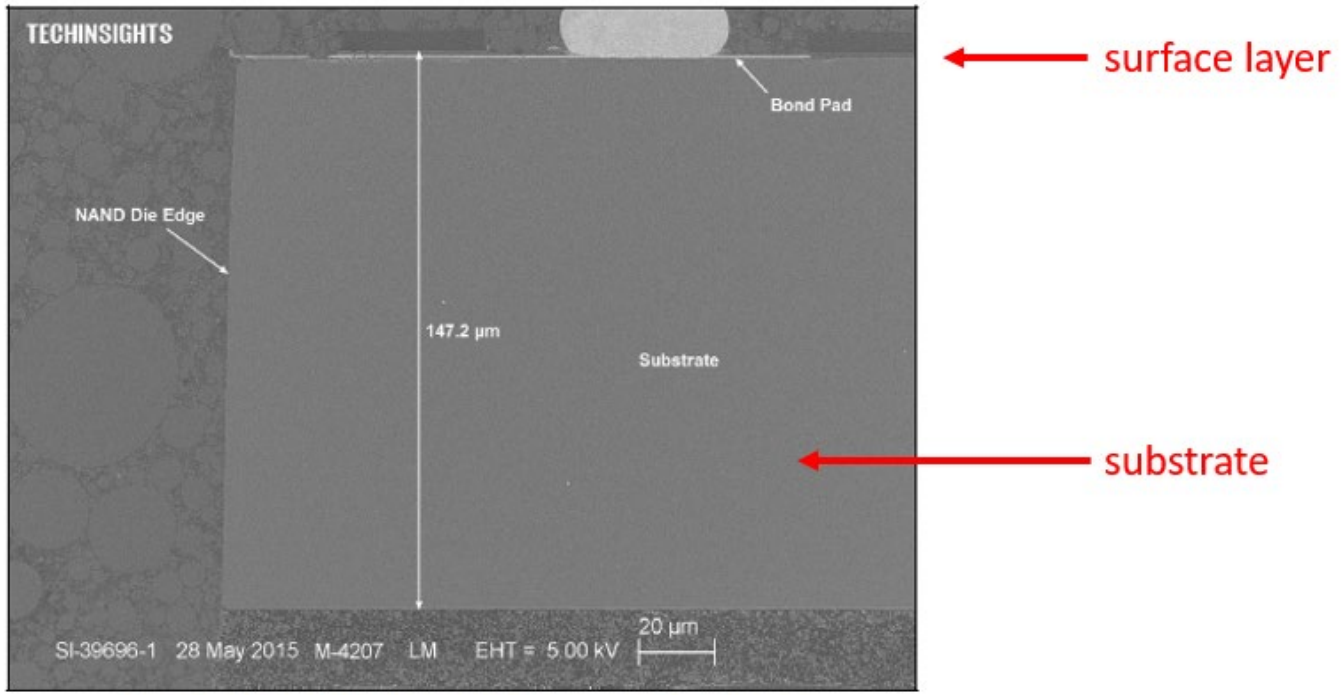
U.S. Patent No. 11,121,222	Accused Products
	 Figure 1.2.3: Die thickness, SEM cross-sectional image
[Claim 44, Element 3] an active region including a source and a drain, disposed on one surface of the surface layer;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Element 3. For example, the SEM image below (discussed at Exhibit A-1, Claim 1, Element 3) shows that the Sandisk flash memory includes an active region including a source and a drain disposed on one surface of the surface layer (e.g., as shown in the SEM image above for Claim 44, Element 2, the surface layer includes one surface facing away from the substrate (the active region is disposed on this surface) and another surface facing towards the substrate).

Exhibit A-3 to Greenthread's Complaint

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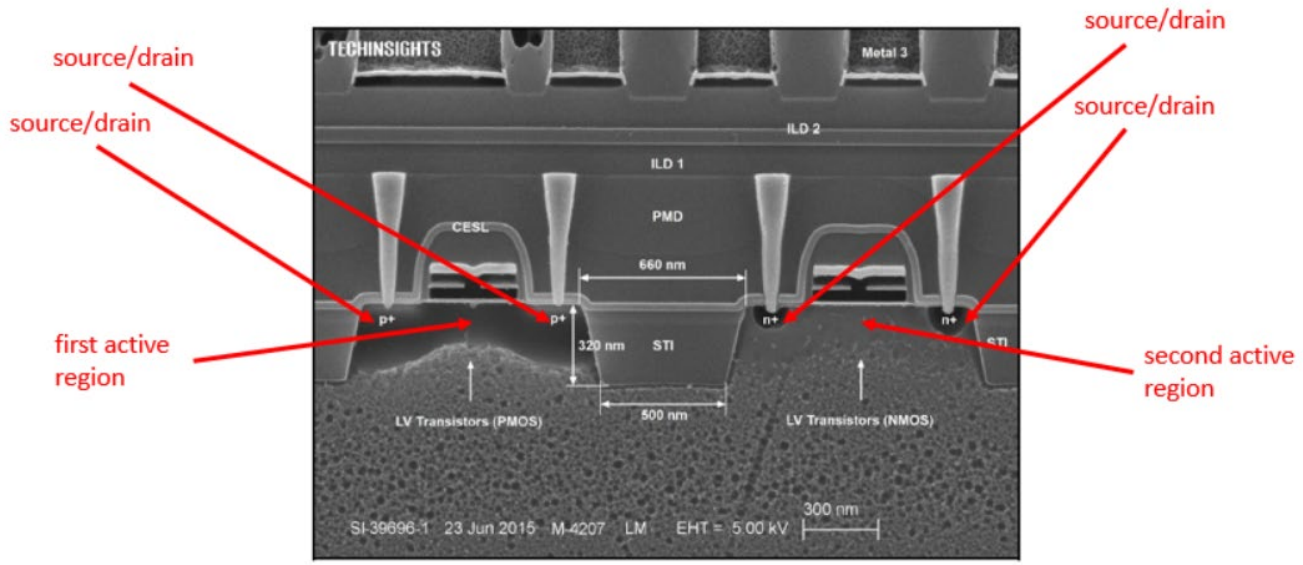
	 Figure 2.3.9: LV logic NMOS and PMOS transistor, SEM cross-sectional image with Si etch
[Claim 44, Element 4] a single drift layer disposed between the other surface of the surface layer and the substrate, the drift layer having a graded concentration of dopants extending between the surface layer and the substrate, the drift layer further having a first static unidirectional electric drift field to aid the movement of carriers from the surface layer to an area of the substrate where there are no active regions; and	The Western Digital Accused Products meet this limitation. *See* above at Claim 21, Element 5. For example, SRP analysis shows that the SanDisk flash memory includes a single drift layer having a graded concentration (annotated with green oval below) as claimed:

Exhibit A-3 to Greenthread's Complaint

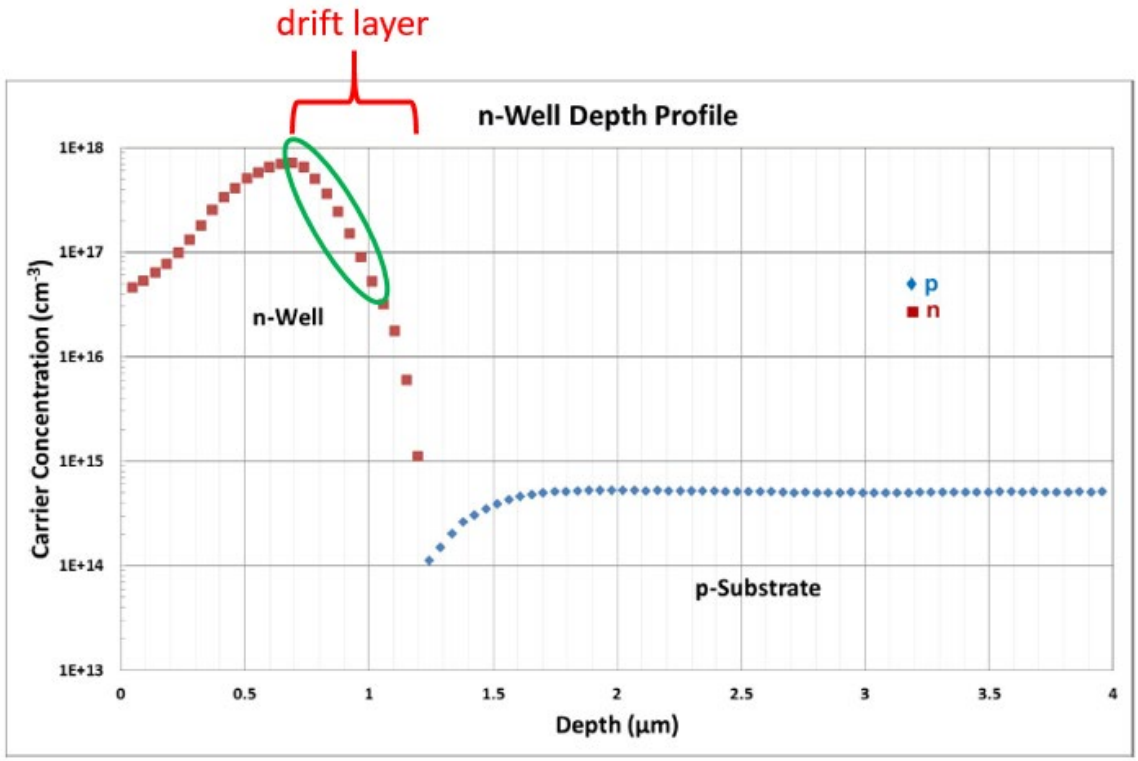
U.S. Patent No. 11,121,222	Accused Products
	 Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile Upon information and belief, the drift layer has a first static unidirectional electric drift field to aid the movement of carriers from the surface layer to an area of the substrate where there are no active regions as claimed, as a result of the above-discussed graded concentration of dopants. Details regarding electric field characteristics are in the possession of the Defendants and are expected to be obtained through discovery. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

Exhibit A-3 to Greenthread's Complaint

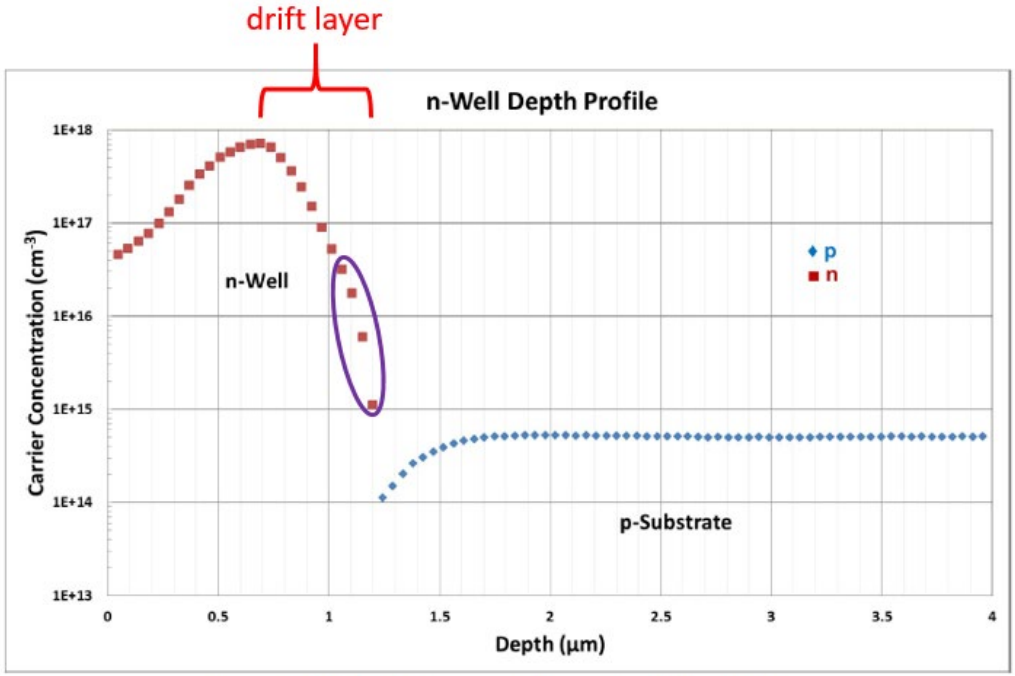
U.S. Patent No. 11,121,222	Accused Products
[Claim 44, Element 5] at least one well region disposed in the single drift layer, the well region having a graded concentration of dopants and a second static unidirectional electric drift field to aid the movement of carriers from the surface layer to the area of the substrate where there are no active regions.	The Western Digital Accused Products meet this limitation. *See* above at Claim 21, Element 6. The well region (discussed above for Claim 21, Element 6) has a graded concentration of dopants (annotated with purple oval below to indicate a region of relatively steeper slope in concentration, compared to the shallower region discussed for Claim 44, Element 4).  Figure 2.1.4: Periphery n-well in p-doped Si substrate, spreading resistance profile Upon information and belief, the well region is disposed in the single drift layer, and it has a second static unidirectional electric drift field to aid the movement of carriers from the surface layer to the area of the substrate where there are no active regions as claimed, as a result of the well region's graded concentration of dopants. Details regarding electric field characteristics are in the possession of the Defendants and are expected to be obtained through discovery. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

Exhibit A-4 to Greenthread's Complaint

U.S. Patent No. 8,421,195	Accused Products
[Claim 1, Preamble] A CMOS Semiconductor device comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a CMOS semiconductor device. *See* Exhibit A-3, Claim 44, Preamble. The SanDisk 15 nm 16 GB NAND flash memory referenced in Exhibit A-1 is discussed in this claim chart and other infringement contention claim charts as an example of a flash memory representative of the Western Digital Accused Products. Upon information and belief, such a SanDisk flash memory is representative of flash memory devices used in the Western Digital Accused Products for purposes of this claim chart and the other infringement contention claim charts because, e.g., other flash memory devices used in Western Digital Accused Products would have similarly been advantageously designed to move carriers (e.g., towards the substrate) and achieve the performance enhancements described and claimed in the '195 patent (and the other asserted patents). For example, other flash memory devices would similarly have been designed with a dopant gradient in order to improve performance characteristics such as on and off switching times and other performance enhancements described in the Abstract of the '195 patent (and the other asserted patents). Therefore, upon information and belief, other flash memory devices used in Western Digital Accused Products contain similar features as the SanDisk 15 nm 16 GB NAND flash memory, and function in a similar way with respect to the features claimed in the asserted claims. This claim chart is based on publicly available information, and additional information regarding these and other accused products is expected to be obtained through discovery.
[Claim 1, Element 1] a surface layer;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 44, Element 1.
[Claim 1, Element 2] a substrate;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 44, Element 2.
[Claim 1, Element 3] an active region including a source and a drain, disposed on one surface of said surface layer;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 44, Element 3.
[Claim 1, Element 4] a single drift layer disposed between the other surface of said surface layer and said substrate, said drift layer having a graded concentration of dopants extending between said surface layer and said substrate, said drift layer further having a first static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 44, Element 4. Upon information and belief, the drift layer (*see* Exhibit A-3, Claim 44, Element 4) has a first static unidirectional electric drift field to aid the movement of minority carriers from the surface layer to the substrate, as claimed. Details regarding electric field characteristics are in the possession of the Defendants and are expected to be obtained through discovery. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 1, Element 5] at least one well region disposed in said single	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 44, Element 5. Upon information and belief, the well region has a second static unidirectional electric drift field to aid the movement of minority carriers from the surface layer to the substrate, as claimed. Details regarding electric field characteristics are in the possession of the Defendants and are expected to be obtained through

Exhibit A-4 to Greenthread's Complaint

U.S. Patent No. 8,421,195	Accused Products
drift layer, said well region having a graded concentration of dopants and a second static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate.	discovery. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
2. The CMOS Semiconductor device of claim 1, wherein the said drift layer is a deeply-implanted layer.	The Western Digital Accused Products meet this limitation. Upon information and belief, the drift layer is a deeply-implanted layer.
3. The CMOS Semiconductor device of claim 1, wherein said drift layer is an epitaxial layer.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 4; Exhibit A-3, Claim 44, Element 4. Upon information and belief, the drift layer is grown above the substrate and is an epitaxial layer.
5. The CMOS Semiconductor device of claim 1, wherein said graded concentration follows a quasi-linear gradient.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Elements 1, 5.
6. The CMOS Semiconductor device of claim 1, wherein said graded concentration follows an exponential gradient.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Elements 1, 5.

Exhibit A-5 to Greenthread's Complaint

U.S. Patent No. 9,190,502	Accused Products
[Claim 7, Preamble] A semiconductor device comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include a semiconductor device. *See* Exhibit A-4, Claim 1, Preamble. The SanDisk 15 nm 16 GB NAND flash memory referenced in Exhibit A-1 is discussed in this claim chart and other infringement contention claim charts as an example of a flash memory representative of the Western Digital Accused Products. Upon information and belief, such a SanDisk flash memory is representative of flash memory devices used in the Western Digital Accused Products for purposes of this claim chart and the other infringement contention claim charts because, e.g., other flash memory devices used in Western Digital Accused Products would have similarly been advantageously designed to move carriers (e.g., towards the substrate) and achieve the performance enhancements described and claimed in the '502 patent (and the other asserted patents). For example, other flash memory devices would similarly have been designed with a dopant gradient in order to improve performance characteristics such as on and off switching times and other performance enhancements described in the Abstract of the '502 patent (and the other asserted patents). Therefore, upon information and belief, other flash memory devices used in Western Digital Accused Products contain similar features as the SanDisk 15 nm 16 GB NAND flash memory, and function in a similar way with respect to the features claimed in the asserted claims. This claim chart is based on publicly available information, and additional information regarding these and other accused products is expected to be obtained through discovery.
[Claim 7, Element 1] a surface layer;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-4, Claim 1, Element 1.
[Claim 7, Element 2] a substrate;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-4, Claim 1, Element 2.
[Claim 7, Element 3] an active region including a source and a drain, disposed on one surface of said surface layer;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-4, Claim 1, Element 3.
[Claim 7, Element 4] a single drift layer disposed between the other surface of said surface layer and said substrate, said drift layer having a graded concentration of dopants generating a first static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-4, Claim 1, Element 4. The graded concentration of dopants observed via SRP analysis (*see* Exhibit A-1, Claim 1, Elements 1, 5) generates a first static unidirectional electric drift field to aid the movement of minority carriers, as claimed. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 7, Element 5] and at least one well region disposed in said single drift layer, said well region having a graded concentration of	The Western Digital Accused Products meet this limitation. *See* Exhibit A-4, Claim 1, Element 5. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

Exhibit A-5 to Greenthread's Complaint

U.S. Patent No. 9,190,502	Accused Products
dopants generating a second static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate.	
8. The semiconductor device of claim 7 wherein said first and second static unidirectional electric fields are adapted to respective grading of dopants to aid movements of carriers in respective active regions.	The Western Digital Accused Products meet this limitation. Upon information and belief, the first and second static unidirectional electric fields are adapted to respective grading of dopants to aid movements of carriers in respective active regions. Details regarding the electric fields and active regions are in the possession of the Defendants and are expected to be obtained through discovery. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
11. The semiconductor device of claim 7 wherein the semiconductor device is a flash memory device.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-2, Claim 16.

Exhibit A-6 to Greenthread's Complaint

U.S. Patent No. 11,316,014	Accused Products
[Claim 1, Preamble] An electronic system, the system comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include an electronic system. *See* Exhibit A-1, Claim 1, Preamble; Exhibit A-4, Claim 1, Preamble. Each Western Digital Accused Product is an electronic system, because a computer is an electronic system. The SanDisk 15 nm 16 GB NAND flash memory referenced in Exhibit A-1 is discussed in this claim chart and other infringement contention claim charts as an example of a flash memory representative of the Western Digital Accused Products. Upon information and belief, such a SanDisk flash memory is representative of flash memory devices used in the Western Digital Accused Products for purposes of this claim chart and the other infringement contention claim charts because, e.g., other flash memory devices used in Western Digital Accused Products would have similarly been advantageously designed to move carriers (e.g., towards the substrate) and achieve the performance enhancements described and claimed in the '014 patent (and the other asserted patents). For example, other flash memory devices would similarly have been designed with a dopant gradient in order to improve performance characteristics such as on and off switching times and other performance enhancements described in the Abstract of the '014 patent (and the other asserted patents). Therefore, upon information and belief, other flash memory devices used in Western Digital Accused Products contain similar features as the SanDisk 15 nm 16 GB NAND flash memory, and function in a similar way with respect to the features claimed in the asserted claims. This claim chart is based on publicly available information, and additional information regarding these and other accused products is expected to be obtained through discovery.
[Claim 1, Element 1a] at least one semiconductor device, the at least one semiconductor device including:	The Western Digital Accused Products meet this limitation. *See* Exhibit A-1, Claim 1, Preamble.
[Claim 1, Element 1b] a substrate of a first doping type at a first doping level having a surface;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 1, Element 1.
[Claim 1, Element 1c] a first active region disposed adjacent the surface with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 1, Element 2; Exhibit A-1, Claim 9, Element 2.
[Claim 1, Element 1d] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 1, Element 3; Exhibit A-1, Claim 9, Element 3.
[Claim 1, Element 1e] transistors formed in at least one of the first active region or second active region;	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 1, Element 4.

Exhibit A-6 to Greenthread's Complaint

U.S. Patent No. 11,316,014	Accused Products
[Claim 1, Element 1f] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the first and second active regions towards an area of the substrate where there are no active regions; and	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 1, Element 5. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
[Claim 1, Element 1g] at least one well region adjacent to the first or second active region containing at least one graded dopant region, the graded dopant region to aid carrier movement from the surface towards the area of the substrate where there are no active regions, wherein at least some of the transistors form digital logic of the semiconductor device.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 1, Element 6; Exhibit A-3, Claim 21, Element 6. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
2. The system of Claim 1, wherein the substrate of the at least one semiconductor device is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 2.
3. The system of Claim 1, wherein the substrate of the at least one semiconductor device has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 3.
4. The system of Claim 1, wherein the first active region and second active region of the at least one semiconductor device contain digital logic formed by one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 4.
5. The system of Claim 1, wherein the first active region and second active region of the at least one semiconductor device contain either p-channel or n-channel	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 5.

Exhibit A-6 to Greenthread's Complaint

U.S. Patent No. 11,316,014	Accused Products
devices in n-wells or p-wells, respectively, and each well has at least one graded dopant.	
6. The system of Claim 1, wherein the first active region and second active region of the at least one semiconductor device are each separated by at least one isolation region.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 6.
7. The system of Claim 1, wherein the graded dopant is fabricated with an ion implantation process.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 7.
8. The system of Claim 1, wherein the first and second active regions of the at least one semiconductor device are formed adjacent the first surface of the substrate of the at least one semiconductor device.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 8.
9. The system of Claim 1, wherein dopants of the graded dopant concentration in the first active region or the second active region of the at least one semiconductor device are either p-type or n-type.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 9.
13. The system of claim 1, wherein the transistors which can be formed in the first and second active regions of the at least one semiconductor device are CMOS digital logic transistors requiring at least a source, a drain, a gate and a channel.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 13.
15. The system of Claim 1, wherein the at least one semiconductor device is a complementary metal oxide semiconductor (CMOS) with a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 15.
16. The system of Claim 1, wherein the at least one semiconductor device is a flash memory.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 16.

Exhibit A-6 to Greenthread's Complaint

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17. The system of Claim 1, wherein the at least one semiconductor device comprises digital logic and capacitors.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 17.
20. The system of Claim 1, wherein each of the first and second active regions of the at least one semiconductor device are in the lateral or vertical direction.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 20.
[Claim 21, Preamble] An electronic system, the system comprising:	To the extent the preamble is a limitation, the Western Digital Accused Products include an electronic system. *See* above at Claim 1, Preamble.
[Claim 21, Element 1a] at least one semiconductor device, the at least one semiconductor device including:	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1a.
[Claim 21, Element 1b] a substrate of a first doping type at a first doping level having a surface;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1b.
[Claim 21, Element 1c] a first active region disposed adjacent the surface of the substrate with a second doping type opposite in conductivity to the first doping type and within which transistors can be formed in the surface thereof;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1c; Exhibit A-1, Claim 9, Element 2.
[Claim 21, Element 1d] a second active region separate from the first active region disposed adjacent to the first active region and within which transistors can be formed in the surface thereof;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1d; Exhibit A-1, Claim 9, Element 3.
[Claim 21, Element 1e] transistors formed in at least one of the first active region or second active region;	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1e.
[Claim 21, Element 1f] at least a portion of at least one of the first and second active regions having at least one graded dopant concentration to aid carrier movement from the surface to an	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1f; Exhibit A-1, Claim 9, Element 5. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.

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area of the substrate where there are no active regions; and	
[Claim 21, Element 1g] at least one well region adjacent to the first or second active region containing at least one graded dopant region, the graded dopant region to aid carrier thereof movement from the surface to the area of the substrate where there are no active regions, and wherein the graded dopant concentration is linear, quasilinear, error function, complementary error function, or any combination thereof.	The Western Digital Accused Products meet this limitation. *See* above at Claim 1, Element 1g; Exhibit A-3, Claim 21, Element 6. *See also* SRP analysis reproduced at Exhibit A-1, Claim 1, Element 5 electrically characterizing the accused product and showing carrier movement and electric fields. SRP analysis generally is discussed at Exhibit A-1, Claim 1, Element 5.
23. The system of Claim 21, wherein the substrate of the at least one semiconductor device is a p-type substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 23.
24. The system of Claim 21, wherein the substrate of the at least one semiconductor device has epitaxial silicon on top of a nonepitaxial substrate.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 24.
25. The system of Claim 21, wherein the first active region and second active region of the at least one semiconductor device contain at least one of either p-channel and n-channel devices.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 25.
26. The system of Claim 21, wherein the first active region and second active region of the at least one semiconductor device contain either p-channel or n-channel devices in n-wells or p-wells, respectively, and each well has at least one graded dopant.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 26.
27. The system of Claim 21, wherein the first active region and second active region of the at least	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 27.

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one semiconductor device are each separated by at least one isolation region.	
28. The system of Claim 21, wherein dopants of the graded dopant concentration in the first active region or the second active region of the at least one semiconductor device are either p-type or n-type.	The Western Digital Accused Products meet this limitation. *See* Exhibit A-3, Claim 28.